Printed for Robert Harford at the Signe of the Angell in Cornhill.

A TREATISE
OF THE
ARMS and ENGINES
OF
WAR,

Of Fire-works, Enſigns, and Military Inſtruments, both Ancient and Modern; With the Manner they are at preſent uſed, as well in French Armies, as amongſt other Nations.

Inriched with many Figures.

Written Originally in *French* by *Lowis de Gaya*, Author of the Treatiſe called *The ART of WAR.*

Tranſlated for Publick Advantage.

LONDON, 2·6

Printed for *Robert Harford*, at the Sign of the *Angel* in *Corn-hill*, near the *Royal Exchange*; 1678.

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LIBRARY
OXFORD

To the Right Worſhipful Sir *JONAS MOORE* Knight, Surveyor General of His Majeſties Ordnance and Armories.

Honoured Sir,

BE *pleaſed to accept the Patronage of theſe few Sheets; which as they contain a* Treatiſe of Arms, &c. *can no where more ſecurely ſhelter themſelves than under the Banner of Your Protection: For being cheriſhed by Your Allowance, the World may well imagine that there is ſomething more than ordinary comprehended in them which may merit a ſerious Reading and a generous Practice; eſpecially at ſuch a time, as this, for Warlike Preparation.*

I must confess the Trust You have, deserves far Nobler Presents of this nature than what here I make. Nor am I ignorant how far my Presumption has carry'd me in this attempt. In excuse whereof, I have onely, with Your kind Permission to plead the Encouragment of Your continual Favours, and Advantagious Obligations to a Young Beginner; of which should I be once ingratefully forgetful, when the least Mite of Opportunity offers, I should incur a crime that would deprive me of one of the chiefest happinesses whereto I aspire; which is to acknowledge my self Sir

Your most Obedient
and most Obliged
Servant

R. H.

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T

The Author's Deſign.

IN the Profeſſion of *War* there are Three things onely requiſite, *Men*, *Arms*, and *Fortifications*. So many able Men hath already treated of *Fortifications*, that I thought it would be to no purpoſe to ſpeak on that Subject, unleſs I intended to be an Eccho, and repeat what others have already ſaid. I have ſpoken of Men lately in a Book, which I called, *The Art of War*; but if I miſtake not, no Man hath hitherto treated of *Arms*. And therefore that theſe Three Parts may be compleat, I thought fit to publiſh this little Treatiſe, wherein I ſhall explain as clearly, and in as few words as poſſibly I can, the uſe of all *Arms*, which are at preſent to be found in *Armies*, as well as of thoſe that were heretofore in uſe among the *Romans*.

AN

AN ADVERTISEMENT

For the better understanding of all that is said in this Treatise concerning Arms; *you must know* (*Reader*) *that the French* Pound *contains two* Marks, *the* Mark *Eight* Ounces, *the* Ounce *Eight* Gros *or* Drams, *the* Dram *three* Deniers, *and the* Denier *Twenty four* Grains.

The Fathom *contains six* Foot, *the* Foot *twelve* Inches, *and the* Inch *twelve* Lignes.

The Cubit *of the Ancients consisted of two* Hands *and three* Fingers *breadth.*

The Hand *of twelve* Fingers *breadth, and the* Fingers *breadth of eight* Lignes.

The Talent *weighs Threescore* Pounds, *the Roman* Pound *contains twelve* Ounces, *the* Ounce *eight* Drams, *the* Dram *three* Scruples, *the* Scruple *six* Siliques, *and the* Silique *one* Grain.

The small Sexterce *weighed Twenty four* Pounds.

AN ELOGY ON *The Profeſsion of Arms*; AND THE ORIGINAL OF *TRUE NOBILITY.*

THE Profeſſion of Arms hath in all Ages been the moſt Honourable and Glorious of all Profeſſions; and no man in *Rome* could riſe to the Civil Magiſtracy, who had not ſerved Ten years in the Wars. By Arms Kingdoms ſubſiſt, Juſtice flouriſhes, the Wicked are puniſhed, and the Proud humbled to their Duty; and from them alone True Nobility

derives its Original. Before, all men were born equal, and the difference of Eſtates and Offices, made the ſole diſtinction of Perſons.

War in Ancient Times was neither the Refuge of the Wretched, nor the Sanctuary of the Baniſhed; and the Romans received none but Choſen Men into Service, who were obliged to put themſelves in Equipage, and for the ſpace of Twenty years ſerve at their own Expences, either among the Horſe or Foot; and when they had fulfilled the term of their Service, they received from the Commonwealth Rewards ſuitable to the merit of their Actions, either by being promoted to the moſt Honourable Charges, or being endowed with Lands and Inheritances in the Conquered Provinces, where after the Fatigues of War they quietly enjoyed the Sweetneſs of Peace. And that the Natives of the Countrey might not be baniſhed, but means of ſubſiſting afforded them, they gave them lands to labour, for payment of a yearly Tribute

Tribute. Hence have ſprung Tenures, Dependancies, Quit-Rents and Duties, which Vaſſals owe to their Lords and Superiors.

Theſe new Maſters made themſelves at firſt conſiderable by that Politeneſs which was ſo natural to the Romans, by that way of Living, which puts a Diſtinction between thoſe that have Carried Arms and ſuch as have not, and by the reputation of their brave Exploits, which they had engraven on their Shields, as a Mark of the Nobility which they had acquired by their Valour. And from thence we have Scutcheons, and the Name of Eſquire or Gentlemen.

All Rewards were not of equal value, and were diſtributed according to merit, as I have already ſaid. He who in an Aſſault firſt mounted the Wall of a Town, was honoured with a Mural Crown; and on him who had reſcued a Roman Citizen, was conferred a Civick Crown, which was put upon his Head by the Perſons

own hands whom he had relieved from danger. Thoſe whoſe Actions were brave and more commendable, were likewiſe more highly rewarded than others, and had allotted them a larger ſhare of Lands. Such, I ſay, were of Chiefeſt Note amongſt the Nobility, as well in reſpect of their Wealth, as in conſideration of thoſe Glorious Crowns, which they carried on their Scutcheons: And from them are deſcended the Illuſtrious Families of great Lords, who carry Coronets over their Arms, and who in progreſs of time have changed their Ancient Crowns into thoſe which they bear at preſent, according to the new Dignities wherewith Sovereigns have been pleaſed to honour them; as of Duke, Marqueſs, Earl, Viſcount, and Baron. And though the Quality of Baron be wholly baniſhed from the Court of *France*, yet it was the firſt, and I may ſay, the onely Dignity that was heretofore in *France*; as may be ſeen in the Ancient Chronicles of the Kingdom, when they ſpeak of Kings accom-

accompanied with the Chief Barons, who were in that time, what the Dukes and Peers of *France* are at preſent. This puts me in mind of an Epiſtle in Gauliſh Verſe; which is yearly ſung at High Maſs in the Pariſh Church of St. *Stephen* of *Rheims*, on the Twenty ſixth of *December*, the Feaſt day of that Saint; which thus begins:

Or ecoutez la paſſion
De Saint Eſtienne le Baron, &c.

Now hearken to the paſſion
Of Saint Stephen *the Baron.*

The good people of paſt Ages would have thought themſelves wanting in Reſpect and Veneration towards the Saints, if they had not qualified them with the Name of Baron; which was the Nobleſt Title of the great Lords of their Times. I thought fit to adduce this inſtance, to prove the Antiquity of Baronies; but that I may return to my Subject,

I affirm that Arms have not onely made Dukes, Marquiſſes, Earls, and Gentlemen; but that they have alſo raiſed to the Throne Men of a low and deſpicable Birth.

King *David* was a Shepherd, as well as *Saul* his Predeceſſor. *Antipater* King of *Macedonia*, was the Son of a Jugler; *Agathocles* King of *Syracuſa*, the Son of a Potter; *Cambyſes* King of *Perſia*, the Son of a Beggar; King *Darius*, the Son of a Carter; King *Sibaris* had been a Servant in an Inne; and the Ottomans, who at this day poſſeſs the greateſt Empire in the World, are deſcended from Grooms, or Men that drove Camels. Theſe Examples oblige us to acknowledge, that it is by Arms alone that Men render themſelves worthy of the moſt Glorious Employments. So likewiſe in that Profeſſion is to be learnt that brave and gentile way of Demeanor, which is found no where but among the Nobility and Gentry. There, every thing goes by Honour, and without any hopes of Lucre and Profit,

Profit. There, Men learn to be generous, liberal and faithful. There is nothing to be found in the Hiſtories of the greateſt Captains, but Acts of Honour and Vertue. The Valour of *Alexander*, the Piety of *Eneas*, the Prudence of *Cæſar*, the Modeſty of *Tiberius*, the Complaiſance of *Antonius Pius*, the Juſtice of *Aulus Fulvius*, the Clemency of *Auguſtus*, the Magnificence of *Titus Veſpaſian*, the Chaſtity of *Scipio Affricanus*, and the Integrity of *Attilius Regulus*; are ſufficient proofs of what I have alleadged.

To conclude, I ſhall repeat what I ſaid in the beginning of this Diſcourſe, that the profeſſion of Arms has been in all Ages, not onely the moſt glorious and honourable of Profeſſions; but likewiſe that which has produced the greateſt men.

These Two Books newly published, are to be sold by Robert Harford *at his Shop at the* Angel *in* Corn-hill, *near the* Royal Exchange.

THE *Art of War*, and the way that is at present practised in *France*. Two Parts. Wherein the Duties and Functions of all the Officers of Horse and Foot, Artillery and Provisions, from the General of the Army to the Private Souldier, are treated of: With the method of Conducting Armies, Encamping, Besieging, and giving of Battel: As also an account of all Offices and Charges; and the Names of the Towns, Places, Citadels, Castles and Forts, where the most Christian King keeps Garison; with the general and particular terms of War. Written in *French* by *Lovis de Gaya*, an expert Officer of the French Army, and Dedicated to his most Christian Majesty. Translated for publick Satisfaction and Advantage. In 8°.

The Military Duties of the Officers of Horse, Containing the Exercise of the Cavalry, according to the present Practice of the imes. With the Motions of Horse, and the Functions of every Officer, from the Chief Captain, to the Brigadeer. Written in *French*, by an Ingeneer in Ordinary to his most Christian Majesty. And Translated for publick Satisfaction and Advantage: In 8°.

A Treatiſe of

ARMS,

Of Engines, Artificial Fires, Enſignes; and of all Military Inſtruments.

The Firſt Book.

Of the ARMS of A SOULDIER.

CHAP. I.

Of Sharp Weapons.

Sect. 1.

Of the Sword.

THE Sword, whereof the Invention comes to us from *Tubal-Cain*, the Son of *Lamech* and *Zilla*, is the firſt of all Weapons, without

without which a Souldier ſhould never appear in publick ; becauſe it ſerves him for Ornament as well as Defence. It is not neceſſary it ſhould be too long, for it becomes thereby cumberſome in a Battallion ; eſpecially during the time of the Motions : nor muſt it be too ſhort neither, but of an indifferent length ; the Blade muſt be good , and about an inch broad The moſt common length of Blades is two foot and a half and two inches, and the Handles three inches and a half. All Blades are kept in Scabberds , made of Wood covered with Cloath or Leather , having a chape at the end of Iron, Steel, Copper or Silver.

The Sword is carried in a Shoulder Belt of Buff or other Leather , and hangs down from the right Shoulder upon the left Thigh ; in the ſame manner as was heretofore in uſe , according to the report of *Virgil.*

— *Humero cum apparuit alto balteus.*

And

And of *Silvius* in his Tenth Book.

—— *Tergo qua balteus imo*
Sinuatur; coxaque ſedet munimen utraque.

Nevertheleſs we find by the words of the Royal Prophet, that the Belts which we have ſincecalled Waſte-belts, are more ancient than thoſe we call Shoulder-belts, when he ſays, *Gird your Sword on your Thigh*, &c.

When a man would ſtand right to his Guard, he ought to keep his Body ſtraight, bending a little on the left Thigh; his Legs not too far aſunder, his Feet on a ſtrait Line one after another, the Handle of the Sword off of the Haunch, the point juſt oppoſite to the Shoulder, the Arm ſtretched half out; and the left Hand as high as the Eye. The Enemies Sword may be put by the line of the Body by a little motion of the Handle either inward or outward.

Souldiers in a Battel or Attack, do not regularly alwayes obſerve this Method;

Method; and moſt part thruſt on any way, without troubling themſelves much with the Tierce, Guart, or Feint; but make uſe of their Swords to attack or to defend themſelves, according to the ſmall talent that God Almighty has given them.

The Figure of a Souldier on his Guard.

Sect. 2.

Of the Shable and Cimeter.

THe Shable is more in uſe amongſt the Horſe, than other Bodies of Men, it is not altogether ſo long as the Sword; but to make amends for that, the Blade is twice ſo broad and edged on one ſide; and therefore it is more uſed for cutting than thruſting.

The uſual length of Shables is two foot and four inches, taking it from the guard, and two foot and a half and three inches, from the button of the Pommel to the point.

The Cimeter is a kind of Fauchin, broader and more crooked than the Shable; uſed more by the Turks, Perſians and Hungarians, than others. Sect.

A Souldier on his Guard.
The Espadon or two Handed Sword.
The Shable.
The Cimeter
The Bayonet.
The Ponyard.

page, 12.

Sect. 3.

Of the Bayonet and Poniard, or Dagger.

THe Bayonet is much of the ſame length as the Poniard; it hath neither Guard nor Handle, but onely a Haft of Wood Eight or Nine Inches long. The Blade is Sharp-pointed, and two edged, a foot in length, and a large inch in breadth.

The Bayonet is very uſeful to Dragoons, Fuſiliers, and Souldiers, that are often commanded out on Parties; becauſe that when they have fired their Diſcharges, and want Powder and Shot, they put the Haft of it into the mouth of the Barrel of their Pieces, and defend themſelves therewith as well as with a Partizan.

The Poniard or Dagger is a little Sword, in length but about Twelve or Thirteen Inches, which is carried at the Girdle. It is nor long ago ſince Dueliſts fought with Sword and Dagger.

Sect. 4.

Of the Eſpadon or Two-handed Sword.

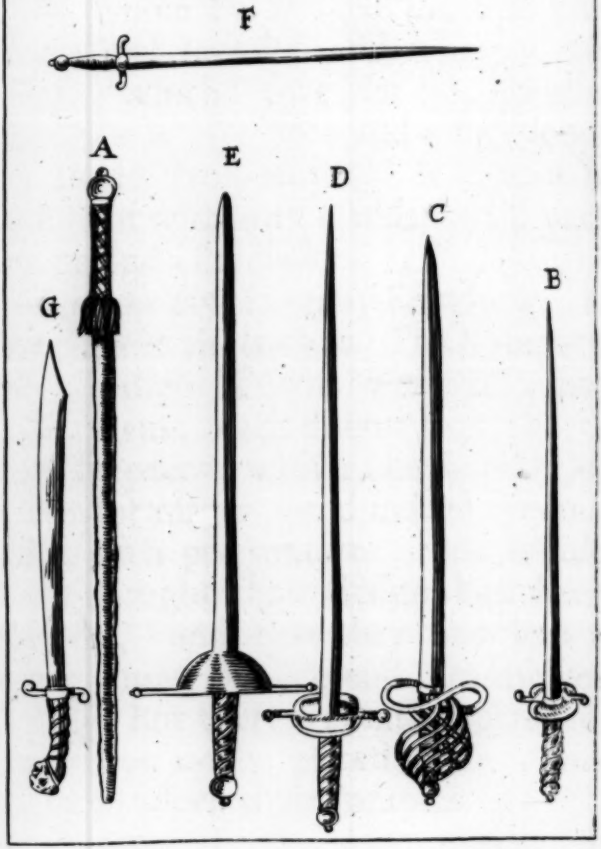
THe Eſpadon is a kind of a Sword, whoſe Two-edged Blade is very long and broad, and whereof the Haft, which I dare not call Handle, becauſe it is a foot and a half long, is made croſs-wayes. It cannot be uſed but with both Hands, in a Breach or behind a Paliſſadoe.

I never ſaw ſo many Eſpadons, as among the Hollanders. The Ramparts of all their Towns were furniſhed with them, each diſtant from the other ſix paces; with a like number of Clubs or Maces: and indeed to conſider ſuch preparatives, one would have thought their deſigns had been furious, and that they had had a great mind to defend themſelves ſtoutly. But there is great appearance, that they onely placed theſe Arms there to adorn their Parapets.

Swords of all Faſhions.

The

Swords of all Sorts.



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The Explication of this Figure.

A, A Stick-Sword, called by the Ancients *Sica.*

B, A Sword for a Rancounter, after the French mode.

C, A *Swiſſer*'s Sword.

D, A Tuck, or long Sword with a narrow Blade, ſuch as were in uſe not thirty years ago.

E, A Spaniſh Sword.

F, A Braquemart Fauchin, or ſhort Sword.

G, A Hunting Cutlaſs, with a Handle of Horn.

CHAP. II.

Of Fire-Arms.

Sect. 1.

Of the Musket.

THe uſual Arms of Souldiers, are not onely the Sword, Shable, Dagger and Bayonet, but alſo the Musket

Musket, Fire-lock, Mouſqueton, Piſtol, and many others: and the firſt thing they ſhould learn, is to make the right uſe of ſuch as their Officers have given them.

The Musket is a Weapon for Foot, the Barrel of which is three foot and eight inches long; mounted on a Stock of four foot and eight inches in length. It was not invented till long after the Canon.

The Bullet of Size contains in diameter eight *Lignes* and a half (every *Ligne* a third part of a Barley Corn) and the charge of Powder ſhould weigh half an Ounce and a Dram of Magazin Powder.

A Musket carries commonly ſix ſcore Fathoms, and if it be re-inforced, a hundred and forty, or an hundred and fifty fathoms.

The half of this diſtance or leſs, is ſufficient for a good Diſcharge; for it is by chance if they hit and do execution at the full diſtance.

The Priming ſhould be of a finer Powder than the Charge, and the Match dry and hard. For

For the Musket may be uſed double-headed Shot, which are two Bullets faſtned together, by a little piece of Iron, about half an inch long; as may be ſeen by the Figure.

To preſent aright to fire, according to the Rules of exerciſing of Arms; the Butt of the Musket muſt be put to the Breaſt, half a foot below the Chin; the left hand under the Stock, or upon the Scouring Stick, if it be in its place; the right Hand-Thumb, four or five Fingers breadth behind the Breech, and the other Fingers of the ſame Hand under the Tricker, to draw and make the Cock play, when one has a mind to Fire: The Muzzel of the Musket muſt always be as high as the Cheſt of the Body of the Enemy: Skilful Souldiers never aim at the Head, becauſe that part being too ſmall, the leaſt motion of either of the two is enough to make the Bullet miſs; but when one Fires at the Body, whether the motion make the Shot riſe too high, or fall too low, or decline too much to one ſide, the execution is

always good, and puts him who hath received the Shot out of condition of Fighting.

Bandeliers are a kind of Portable Magazine, which contains all the Ammunition neceſſary to a Soulder.

The uſual breadth of their Belt is four inches, and the length four foot. All Bandeliers are furniſhed with a dozen of little Flasks, commonly called Charges, and a little Bag or Purſe of Sheeps Leather. The Flasks ſerve to keep the Powder, and the Bag or Purſe the Bullets.

The Horſe make uſe of Carabin or Mousketon-Belts, in bigneſs much like that of the Bandeliers, but without any Charges.

The Arms of a French Souldier and the Poſture of a Musketteer, who preſents to Fire.

A, The Musket.
B, The Sword.
C, The Bandeliers.
D, The Souldiers Belt.
E, The Bag or Purſe.
F, The Flasks or Charges.
G, The Match.

An

The Armature of a Musketeer presenting to fire.
G
A
D
C
F
E
B
The Musket.
1
2
3
4
5
6
7
8
9
The Fire Lock.
Double headed shot.

page 28.

An Explication of the Parts of a Musket.

1. The Lock. 2. The Pan. 3. The Cock. 4. The Tricker. 5. The Barrel. 6. The Breech. 7. The Stock. 8. The Butt. 9. The Scouring-ſtick.

Sect. 2.

Of the Fuſil, or Fire-Lock.

THe Fuſils or Fire-Locks which we at preſent uſe in the Army, eſpecially amongſt the Fuſiliers and Granadiers, are of the ſame ſize, and carry as far as Muskets.

With a Fire-Lock one may ſhoot juſter than with a Musket, becauſe it is preſented in a quite different way; that is to ſay, the end of the Butt to the Shoulder, the ſide to the Cheek, ſhutting the left Eye, and aiming with the other through the Sight-hole, which anſwers to the little Button on the Muzzel of the Barrel. When

When one would ſhoot on a level, he muſt aim ſtreight at the Mark; and if a Man ſhoot from a low place to a higher, he is to take his aim four fingers breadth underneath the Mark.

Fire-Locks are apter to miſ-give than Muskets, through the defect of the Flints and Springs.

Sect. 3.

Of the Mouſqueton.

THe Mouſqueton is not ſo long as the Fuſil or Fire-Lock; nor does it by a third part carry ſo far, unleſs the Barrel be ſcrewed and rifled; its uſual Charge is an Ounce of Powder, and it is preſented in the ſame manner as a Fire-Lock.

Sect. 4.

Of the Piſtol.

PIſtols are not all of the ſame length nor ſize. The uſual length of the Barrels of thoſe which are at preſent uſed among the Horſe is a Foot, and of

of Stock and all a Foot and a half, or thereabouts.

The Bullet ſized for the Bore is five *Lignes* in diameter, the Charge a dram of Powder; and it will carry forty paces, more or leſs, according to the goodneſs of the Powder.

Piſtols are fired with one hand.

Sect. 5.

Of Carabins.

CArabins are a kind of Fire-Arms, which take their Name from thoſe ancient Souldiers, called Carabins, who commonly made uſe of them in the Wars. They are of two kinds, the Common, and the Extraordinary. The Common are thoſe which were uſed by the Kings Guards not long ago, and are uſually called Carabins with great Locks; which differ in nothing as to length, ſize, and carrying, from Fuſils and Mouſquetons, but onely that they had Wheel-works. The Extraordinary are thoſe which the French call Arque-

buſſes Guttieres : ſuch as are thoſe which are ſtill uſed by all the Arquebuſiers, whoſe little wheel-work is provided of a double ſpring for facilitating and ſpeeding the diſcharge; and whoſe Barrel being thicker than that of Common Carabins, can carry blank about a thouſand paces, with the ſame proportion of Powder as is neceſſary for a Fuſil; becauſe it is ſcrewed and rifled : that is to ſay, wrought and crevaſſed in the inſide from the Muzzel to the Breech, in form of a Screw; and from thence proceeds the juſtneſs of Arquebuſſes.

All Carabins or Arquebuſſes have wheel-works, as well thoſe of great as ſmall Locks, which are bent with a Spanner proportionated to the thickneſs of the Axel-tree of the Wheel; upon which, when one intends to fire, he puts down the Snaphaunce, which in ſtead of a Flint, ought to be provided with a true Mine-ſtone.

Heretofore were uſed Arquebuſſes, which fired with a Match, in the ſame manner as Muskets; but theſe Arms are now out of uſe. The

The King commands at preſent that in every Troop of his Guards be carried eight riſled or ſcrewed Carabins, with Locks like to thoſe of Fuſils, Mouſquetons and Piſtols.

Heretofore Wheel-Locks, Arquebuſſes with Match Locks, Choques, and Carabins, that bend with a Spanner, were in uſe; and ſtrangers uſe them ſtill. It is true, they are ſurer than others, but they are far more cumberſome. All ſorts of Arms may be charged, without any other way of Meaſuring the Powder, than by the following Rule; Put the Bullet into the hollow of your Hand, and pour Powder thereon, until it be covered and appear no more. This is the natural meaſure of all Small Fire-arms. I ſaw in a Gentlemans Houſe of *Picardy* near St. *Quentin*, an Arquebuſſe or Wind Gun, that was charged with the Wind, whoſe Bullet at thirty paces diſtance pierced a Door two inches thick.

The Armature of a French Trooper.

A, The Buffe Coat with Elk-skin-ſleeves.
B, The Buffe Belt.
C, The Shable.
D, The Scarffe.
E, The Carabin-belt of Buff.
F, The Holſter Piſtol.
G, The Mouſqueton or Carabin.
H, The Boots.
I, The Spurs.
K, The Spur-leathers.

Of Staffe-Arms.

Sect. 1.

Of the Pike.

THE Pike is a Weapon where-with Foot defend themſelves againſt Horſe in an open Field. The Pikes environ the Batallions on all ſides, and preſent the Pike to the height

The Armature of a French Trooper.
E
F
B
A
C
G
H
I
The Musquetoon.
The Pistoll.
The Carabine.

page 24.

The Armiture of a Pike man on his Guard.
The Pike.
The halfe Pike.
A
C
B
E
F
The Quarter Staff.
The Halbard.
The Partisan.

height of the Horſes Counters, whilſt the Musketiers fire. A Horſe wounded by a Shot, is but thereby the more animated, but when he feels himſelf pricked with a Pike, all the Spurs in the World cannot make him advance.

This Figure will ſhew the way of Pikes charging to the Horſe.

The Armature of Pike-man of the Guards.

The Explication of this Figure.

A, The Helmet, which the French call Pot on Head.
B, The Corcelet.
C, The Vambraces.
D, The *Taſſets* or Thigh Pieces.
E, The Sword.
F, The Pike.

All Pikes now adayes are of the ſame length, made of ſtrong Aſhe, and very ſtreight; about fourteen or fifteen foot long between the Head and the Foot. The Head is four inches long,

long, and two and a half broad at the largeſt place. The Iron Bands at the Head muſt be long and ſtrong, otherwayes it would be an eaſie matter for the Horſe to cut off the ends of the Pikes with their *Shables.*

The French, according to *Diodorus*, were the firſt that made uſe of the Pike;

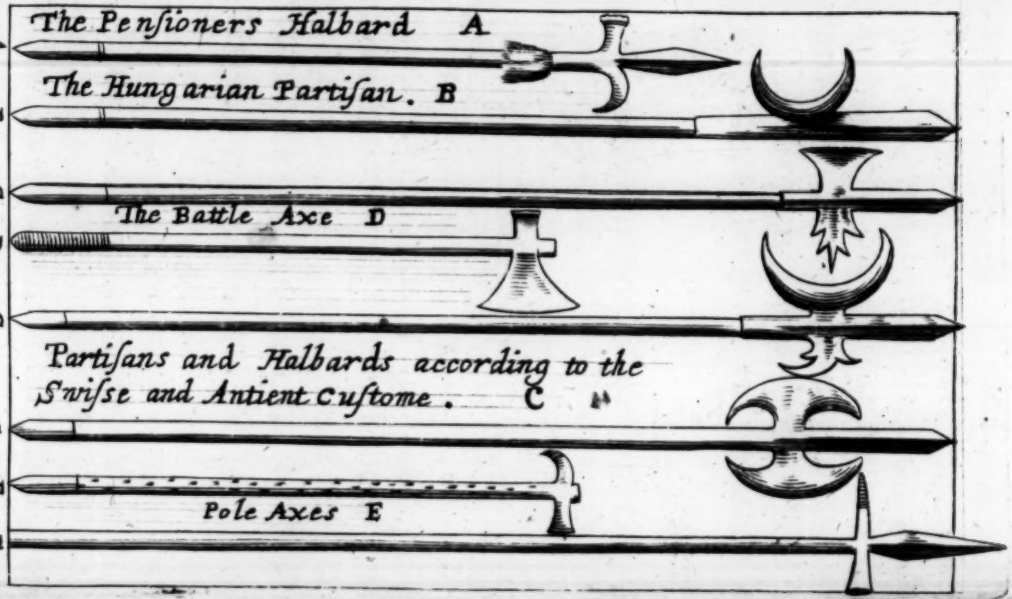
Jaceunt haſtas, quas ipſi lanceas appellant.

And from thence the People of the Chief Province of *France*, have the Name of *Picars*; but their Pikes were more like Spaniſh Lances than Grecian Pikes, which were twenty four foot long between the Head and Foot.

Sect. 2.

Of Spontons or Half Pikes.

THe Spontons or Half Pikes, are made of the ſame Wood as Pikes are, and have Heads alike; their length


The Pensioners Halbard A
The Hungarian Partisan. B
The Battle Axe D
Partisans and Halbards according to the Swisse and Antient Custome. C
Pole Axes E
A
B
C
D
C
C
E
E

Page 27.

length is much the ſame as that of Partiſans, and we have the uſe of them from the Ancients; who carried Pikes ſix Cubits long, as *Arrianus* teſtifies.

Haſtas habebant ſenum cubitorum.

Theſe Arms are much uſed amongſt the Venetians and the Knights of *Malta.*

Sect. 3.

Of the Partiſan.

A Partiſan is an excellent Weapon in a Trench, in a Sally, to force and defend a Lodging, to mount a Breach; and in many other occaſions, where the Pike would be but cumberſome.

The Staffe of a Partiſan is much of the bigneſs of a Pike, and is ſeven or eight foot long between the Head and Foot. The Iron Head is a foot in length, and four inches broad at the largeſt place; the Exerciſe of the Parti-

Partiſan differs in nothing from that of the Pike.

Sect. 4.

Of the Halbard.

THE Halbard is likewiſe a very convenient Weapon, eſpecially when Men come to blows. Its Staff is neither ſo big nor high as that of a Partiſan, and the Head of it both narrower and ſhorter, but it is armed with little Hooks, which ſerve to pull out Fagots, *Paniers*, and *Gabions*, and to take hold of any thing, when one mounts an Aſſault or Sca-Lado.

Sect. 5.

Of Sythes, Forkes, Axes, and Clubs, or Maces.

SYthes, Forks, and Clubs, are likewiſe uſed in a Sally, or in the defence of a Breach or hindering a Storm. The Sythes are not altogether like thoſe of Mowers, for their Staff or Handle

is

page. 28

is ſomewhat longer, and the Blades ſtreighter, or bending a little, after the manner of thoſe which the Trojans uſed of old.

——— *Quo turbine ceſtum*
Sauromates, falcemque Getes.
Stat. 11 Achill.

The Forks are the ſame with the common Forks, but they have little Hooks.

There are two ſorts of Clubs: The firſt is, as it were the Staff of a Partiſan, at the end whereof there is a Wooden Ball of the bigneſs of an Eight pound Bullet; ſtuck full of Iron Pikes a Finger long.

The other has a Boul like to the firſt, hanging at the end of the Staff by an Iron Chain, two foot and a half long; and is uſed as a Flail for Threſhing.

In Salleys, or in the defence of a Breach, Axes are likewiſe uſed, ſuch as not long ago were uſed by the Regiment of *Clerambaud*, or *Sourches*, whoſe

whoſe Heads are very broad, a
their Handles or Staves, longer a
ſtronger than thoſe of Partiſans,
may be ſeen in the Figure.

The Turks have another kind
Club or Mace of Arms, which th
carry at the Pommel of their Saddl
to make uſe of in a Fight, like t
that which the Poets beſtow on *He*
cules, called by the Latines, *Milit*
ris clava. Maces are no more in uſe.

Sect. 6.

Of the Quarter-Staff with a Pike a each end.

WE may alſo reckon among Wea
pons the Staff, commonly ca
led the Piked Quarter-ſtaff, and b
the French, the Staff with two ends
becauſe of the Pikes of Iron which i
has at each end: It is made of a ve
ry ſtrong and eaven Wood, ſome
what bigger and heavier than the
Wood of a Pike, ſix foot and a hal
in length between the Verrils, tha
keep faſt the two pikes of Iron ſtuck
in

into the ends of the Staff, which are in length four inches and a half. It is carried on the Haunch like the Halbard, but handled in a different manner, becauſe a man may ſtand to his Guard with it by turning and flouriſhing it, and making the half moulinets every way, and in approaches make uſe either of the point thereof, or in giving a down right blow therewith.

CHAP. IV.

Of the Arms of the Ancients.

Sect. 1.

Of the Swords, Shables, and Cutlaſſes.

THe Romans of old made uſe of ſhort, ſtiff, ſharp-pointed, and two-edged Spaniſh Blades.

Polibius ſays, That the Roman Souldiers carried their Swords on the right ſide, and that they only made uſe of it for thruſting, in diſtinction from

from the *Gauls*, who used flat-pointed two-edged Swords, only to cut with. *Proprium Gallicani usus pugnare, cæsim.*

The Medes, Parthians, and Persians, used a kind of Cutlass, which they called *Cinacis*, and in English Cimeter. *Cateia* is a Shable in form of a Sickle, in great use among the Germans.

Quintus Curtius makes mention of a kind of Sword, which he calls *Copidas*, which was a little crooked like to a Syth, wherewith the Ancients cut to pieces Wild Beasts.

The Knife which the Latines call *Cultrum*, and the Grecians *Machæra* was properly the Sword which the Priests used in their Sacrifices, to cut up the Victims; as well as that other which they named *Clana culum*, because therewith they cut the Buttocks of Beasts: they had also a pretty long Iron Knife with an Ivory Haft, which they called *Secespita a Secundo.*

Pa-tazonium was a Shable carried by the Tribunes in a Girdle. The Poniard

niard which the Latines termed *Pugio a Pungendo*, is a little Sword Thirteen or fourteen inches long, which was invented in *Spain*. *Pugiunculus* is a diminutive Poniard, which the Spaniards and Catalonians uſe ſtill to this day.

Sica with the Romans, was a Sword hid in a Staff or Stick, wherewith Men walk, as moſt of the Peaſants of *France* do at this time. *Lingula* was a little Sword made in the ſhape of a Tongue. *Spatha* was likewiſe a Sword of the Ancients, whereof *Julius Capitolinus* ſpeaks, upon occaſion of the Emperour *Maximinus*, *Fecit & ſpathas argenteas, fecit & aureas.* Hence comes the Italian Sword *Spada*, and the Spaniſh *Eſpada.*

Sect. 2.

Of the Pike.

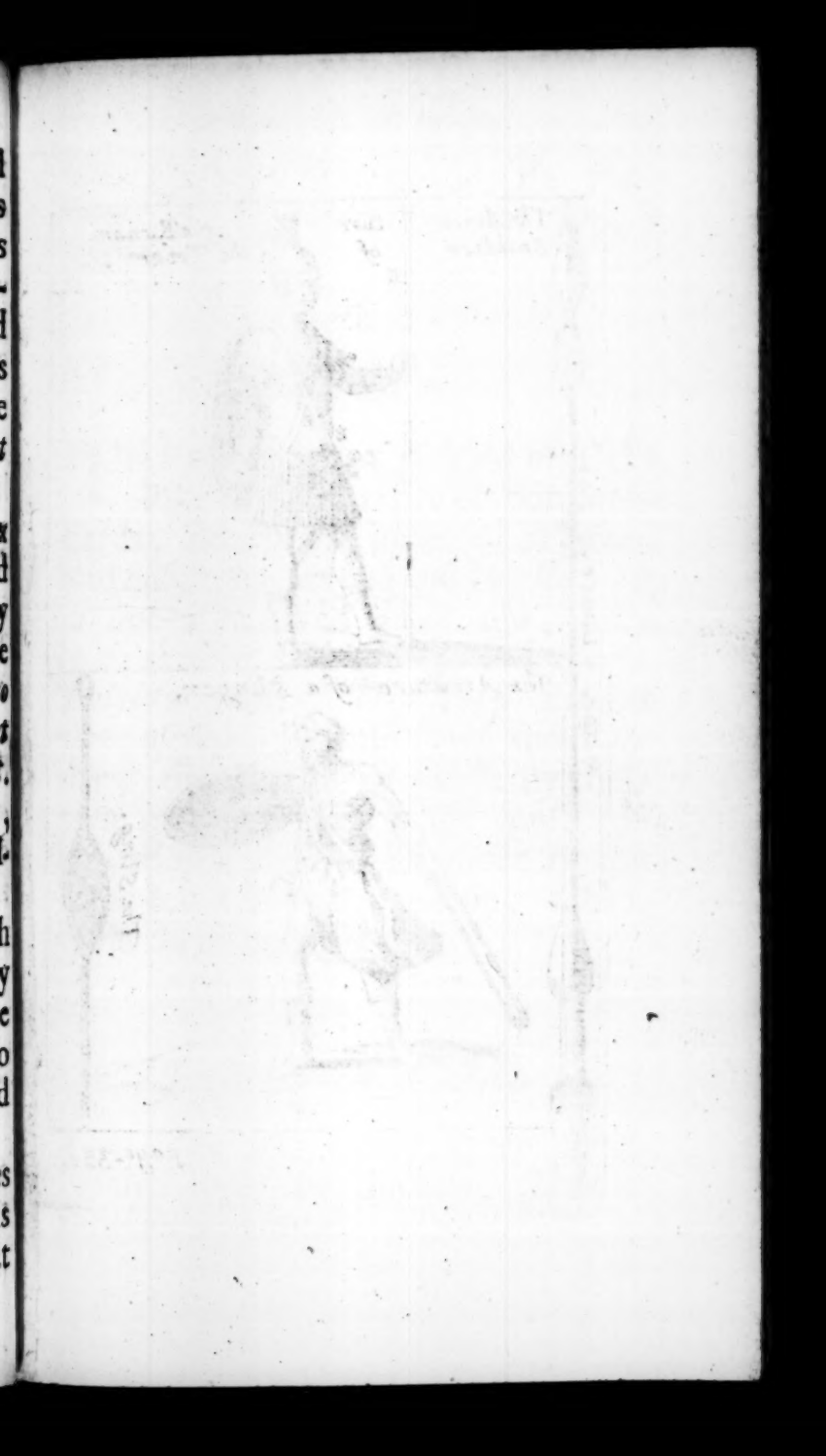
THE *Haſtarii* or Roman Pikeman, had Pikes for Arms, which were afterward taken from them and given to the *Triarii*, inſtead of the *Pili*,

which they were wont to carry. And though their Pikes were not ſo long as thoſe of the Grecians or of Souldiers now adays; yet they defended themſelves therewith againſt the Horſe and fraized their *Cohortes* or Companies with them, as we at preſent fraize our Battaillions: *Quibus acies velut vallo ſepta inhorrebat.*

They carried likewiſe Javelins, ſix Cubits long, which were not armed with Iron at the Head, but had onely a point burnt and hardened in the Fire, as *Arrianus* reports. *Mucro autem illis ferrea non erat, ſed caput igne duratum eundem uſum dabat.* Theſe Pikes were called *Haſtæ Puræ*, and were uſed by the ſtrongeſt Souldiers.

The Germans carried Pikes, which they called *Trameæ*, with a very ſhort and narrow Head; but ſo fine and commodious, that they uſed to Fight with them at diſtance, and near at hand.

The Macedonians carried long Pikes called *Sariſſæ*, and from that it is that



The Armature of a Roman Souldier of the Triarij.
A
E
B
C
D
The Lance.
The Armature of a Slinger.
The Sling.

page. 35.

that *Quintus Curtius* calls the Souldiers of *Alexanders* Guard *Sarissophori.*

Sect. 3.

Of the Lance.

THE Lance was a kind of Half-Pike, like to that of our Standards, which was invented in *Spain*, and only used among the Horses. It is not a hundred years ago, since in *France* we had Troops of Lancers. *Polybius* saith, *That these Lances were useless*, because being too slender, they broke to pieces by their own motion before they could do execution; and left no more in the Hand but a short Truncheon, which could do no more service.

Sect. 4.

Of the Javelot or Dart.

THe Ancients called every thing that may be thrown, *Javelot Jaculum a jaciendo.*

The Dart or *Pilum* was the Weapon which the Romans gave to their Velites or Skirmiſhers; it was in length two Cubits, and a fingers breadth in thickneſs: the Head of it was of Iron, a foot long, but ſo thin and ſharp-pointed, that being once thrown, it bowed and became crooked; ſo that the Enemies could not uſe it any more.

They had likewiſe other Javelots or Darts, with Three Feathers at the lower end, like to the Arrows and Darts which the Polonians and many others ſtill uſe, eſpecially the Moors, who call them *Zogayes*.

Ælicles was the Ancienteſt of Darts, a Cubit and a half long, with a double point, which was tied to the Wriſt with a Leather Strap or Cord, to pull it back with when the blow was given.

Æganea, was a very light Javelot or Dart.

Ancyle, was a Dart which gave the name of *Anciliſta*, to thoſe that uſed it.

Anſatæ, were Darts thrown by Handles.

Dolones

Dolones, Were Javelots, which had their name from the Greek word *Dolos*, which ſignifies hurt.

Geum, Was a Javelot wholly of Iron.

Manobarbulus, Was a Javelot or Dart, like to the Leaden *Piles*, and the Souldiers that uſed them were called *Manobarbuli.*

Materis, Was a Javelot not fully ſo long as a Lance.

The *Pile* was a kind of half Pike, about five foot long. The Roman *Pile* was but three foot long, with a Head barb'd, like a Serpents Tongue, which weighed nine ounces.

Romphea, Was the Thracian Javelot.

Runa, Was a Javelot with a very large broad Head.

Spara, Was a very little Dart, called ſo *Aſpargendo.*

Tragula, Was a Javelot or Screw, with which they drew towards them the enemies Buckler.

Triphorum, VVas a Shaft three Cubits long, which the French call *Materas*,

teras, in Engliſh a Quarel, and was ſhot out of a Croſs-bow. The Ancients had alſo other Javelots or Darts, which they variouſly named according to their different Figures; as *Sibina*, *Geſa*, *Sigimnum*, *Urbina*, *Vervina*, *Verutum*, and *Venabulum*. The latter was uſed by Huntſ-men, and *Geſa* by the *Gauls*.

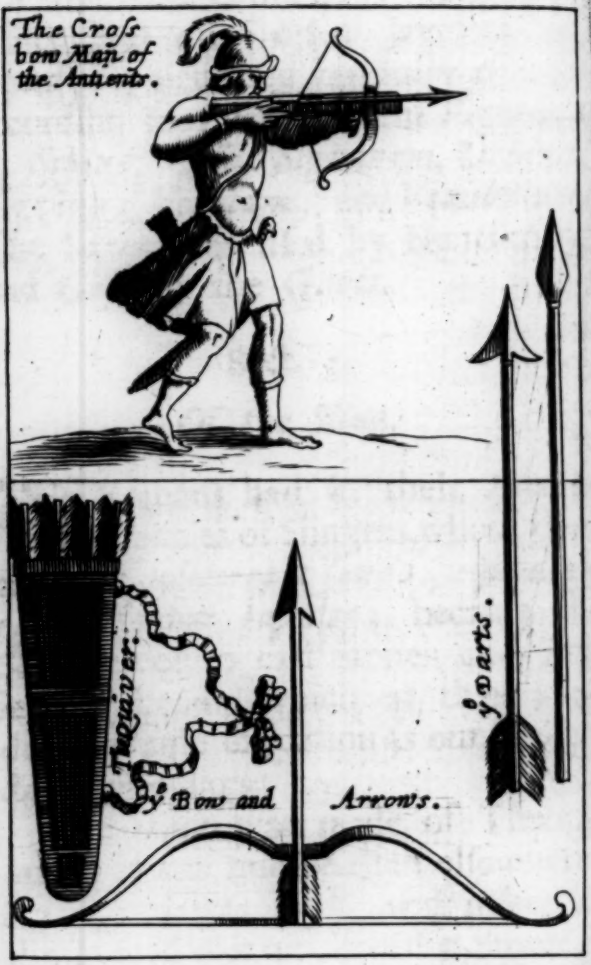
Sect. 5.

Of the Sling.

THe Romans had in their Armies Companies of Slingers, whom they called *Funditores a funda*, *quod ex ea fundantur lapides*; becauſe the Sling ſerved to caſt Stones and Bullets of Lead, which at that time did the ſame execution as our Mukets do now-a-days.

The Sling was made of Thread, larger in the middle than elſewhere, its Figure was oval, and inſenſibly diminiſhed; it would caſt a Stone or Bullet Six hundred paces.

The Iſlanders of *Majorca* and *Minorca*,


The Cross bow Man of the Antients.
Quiver.
ye Bow and
Arrows.
ye Darts.

norca, were the Inventers of Slings, and the moſt expert in throwing of Stones; for they were bred to that Exerciſe from their Infancy; and the Mothers never gave their Children any thing to eat but what they had beaten down before. There is mention made of Slings in Holy Scripture, and *David* made uſe of one when he Fought againſt the Gyant *Goliah*.

Sect. 6.

Of Bows and Arrows.

THe uſe of Bows and Arrows is not in all places aboliſhed. The Turks retain them ſtill in their Armies, as well as the Affricans, Americans, and moſt part of the People of *Aſia*; but none are ſo skilful as the Tartars, in ſhooting with a Bow backwards and forwards. The Wounds made by Arrows are more dangerous and harder to be cured than thoſe that are made by Musket Bullets, becauſe their Heads being

barbed, it is difficult to pull them out of the Body, without tearing the parts about the Wound, and danger of breaking the Shaft.

The original of Bows and Arrows is uncertain, ſome attribute the invention of them to the *Candiots*; others to the *Scythians* and *Perſians*: but there is no doubt but that the Arabians have been always eſteemed the moſt skilful in the exerciſe of the Bow, and thoſe who have uſed the greateſt.

The *Goths* carried hardly any other Arms but Bows and Arrows; yet the Romans had no Bow-men in their Armies, but ſuch as came with the Auxiliary Forces.

The Quiver was a little Magazine of Arrows, which the Archers carried on the left Shoulder.

Sect. 7.

Of Croſs-bows.

THE Ancients had two kinds of Croſs-bows, the one which ſhot Darts

The Armature of the Roman A of a Bow man Allies.

The Armature of a Roman Centurion.

Darts or Quarrels, and the other which threw Stones: Theſe were called *Baliſtæ*, and the other *Catapultæ*.

It would nevertheleſs ſeem (according to *Appius*) that the *Catapulta* ſerved to ſhoot both Darts and Stones; for he ſaith *Catapultæ turribus impoſitæ & quæ ſpicula milterent, & quæ ſaxa.*

The invention of Croſs-bows came from the Sicilians, as *Diodorus* reports. They made both great and little Croſs-bows: the great were drawn on Wheels, as our Canon are, and threw Darts three Cubits long. The little ones were carried by Foot Souldiers, who were called Croſs-bow-men, but their Quarrels were not half ſo long as the Darts of the other; which were of ſuch a greatneſs that they could throw Stones ſix ſcore pound weight.

There were an other kind of Croſs-bows of a middle ſize, that were carried on Wagons, and were called *Orcubaliſtæ*, and *Carobaliſtæ*.

Others there were which ſerved to throw

throw Artificial Fire, and Darts called *Phalaricæ*, or Fire-brands, becauſe they were covered with Sulpher, Pitch, Tar, and Tow dipped in Oyl.

The Scorpion was likewiſe a kind of Hand-croſs-bow, invented by the *Grecians*, which they uſed in Shooting of little Shafts, whoſe Heads were extreamly ſmall and pointed.

CHAP. V.

Of Defenſive Arms.

Sect. 1.

ALL Weapons are both offenſive and defenſive, becauſe with the ſame one may both attack and defend; but there are ſome Arms which are meerly defenſive; as for inſtance, The Head-piece, termed the Cask or Casket, Morions, Cuiraſſes, Corcelets, Gorgets, Vambraces, Taſſets, or Thigh-pieces, Knee-pieces, Guard-reins or Rein-pieces, Gantlets, and round Targets or Bucklers, which were

were uſed in times paſt, and which are ſtill in uſe in many remote Countries, eſpecially among the Turks and Moors.

The Romans armed part of their Cavalry Cap-a-Pie, in imitation of the Grecians; the French retained the ſame Cuſtom, and from that comes the name of *Gens-d'arms*: That Armour was onely good to reſiſt Swords, Stones, Pikes, Arrows, and Javelots or Darts. The Armour which is made now-a-days, is proof againſt Musket and Piſtol-ſhot; but none but the Officers carry them on the moſt dangerous occaſions.

The Head-pieces, and the fore part of Cuiraſſes, are Musket-proof, and the other parts Piſtol or Carabine-proof; but that ſuch Armour may prove good, it is needful they be beaten out of cold Iron.

Head Armour has different names, as Cask or Casket, Helmet, Head-Piece, Burgonet or Spaniſh Marron, Salade, Morion, Cabaſſet, Pot, Hat, and Steel-bonnet. Of all theſe Pieces of Armour

mour ſome have Viſieres, and are Musket-proof: others are plain and onely proof againſt a Cut or Blow.

The Cuiraſs is Musket-proof, and heavier than the Breaſt-plate, the Corſlet which is of the ſame ſhape as the Cuiraſs, ſerves to defend the noble parts.

The Neck is defended by the Gorget, the Arms by the Vambraces, the Shoulder-pieces, Fore-arm-pieces, Goſſets, and Gantlets; the Thighs and Legs, by Taſſets, Cuiſſots or Thigh-pieces, Greves, or Shin-pieces, Knee-pieces, and Supeters or Foot-pieces.

Sect. 2.

Of the Coat of Mail.

THE Coat of Mail, by the Romans called *Hamatus Thorax*, was a kind of Steel Jacket; made of little Rings and Links of Mail, interwoven together, wherewith their *Gend'arms* defended themſelves againſt Arrows, Darts and Swords.

The

The Light Horſe, in time of *Lovis* the Eleventh, made Vambraces and Gantlets of the ſame, and therewith guarded the void ſpaces betwixt their Armour.

Though theſe Jackets be now no more in publick uſe, yet there are ſome who ſtill carry them under their Shirts, eſpecially ſuch as are in fear of Fighting Duels, or of being ſet upon.

None at this time in *France* are armed Cap-a-Pie, except the Pikes of the Kings Regiments of Guards; but their Armour is onely proof againſt a Cut.

Sect. 3.

Of the Buff-Coat.

THough to ſpeak properly, Buff-Coats be but an Apparel of Horſemen, yet we may reckon them among their defenſive Arms, ſeeing they may eaſily reſiſt a Sword, if they be made of a good Skin.

They are of the ſame uſe to our Horſe

Horſe, that theſe hard Skins, where-of they made Breaſt-plates or Stomachers, were to the Roman Souldiers; of which *Varo* makes mention.

Buffe-Coats are made in form of a *Juſt au Corps*, or Cloſe Bodied Coat, with four Skirts reaching down to the Knee.

There is no Trooper in the French Army but has his Buffe-Coat, ſince Harnaſs has been laid aſide; and from thence comes the name of *Light-Horſe*, in imitation of the Ancient Horſe, who never carried Cuiraſs, but Fought always in Light-Cloaths; as *Polibius* ſaith, *Antiquit: us equites loricas non habebant, ſed in veſte ſuccincta pugnabant.*

Sect. 4.

Of Casks or Head-pieces.

THe Romans wore Head-pieces of Braſs or Iron, Proof againſt the Cuts of Shables; which they delighted to adorn with Feathers and Plumaches of ſeveral Colours, two foot high. The Souldiers thereby appeared half

as

Helmet.
Curiasse.
Gorget.
Thigh peeces or Tassets.
Vambrasse.
Gantelet.

as high again, and ſtruck the enemy with greater fear; as *Polibius* affirms. *Vir duplo major apparet, & pulchra ea ſpecies ſit, hoſtiq formidoloſa.*

The Generals and principal Officers, wore Head-pieces guilt and ſet with precious Stones; the top whereof was adorned with Feathers and rich Plumaches, which made them conſpicuous among the reſt.

Criſtaq; tegit galea aurea rubra.

The original of Head-pieces came from the Lacedemonians, and *Cares* was the firſt that beautified them with Plumaches.

Sect. 5.

Of Cuiraſſes.

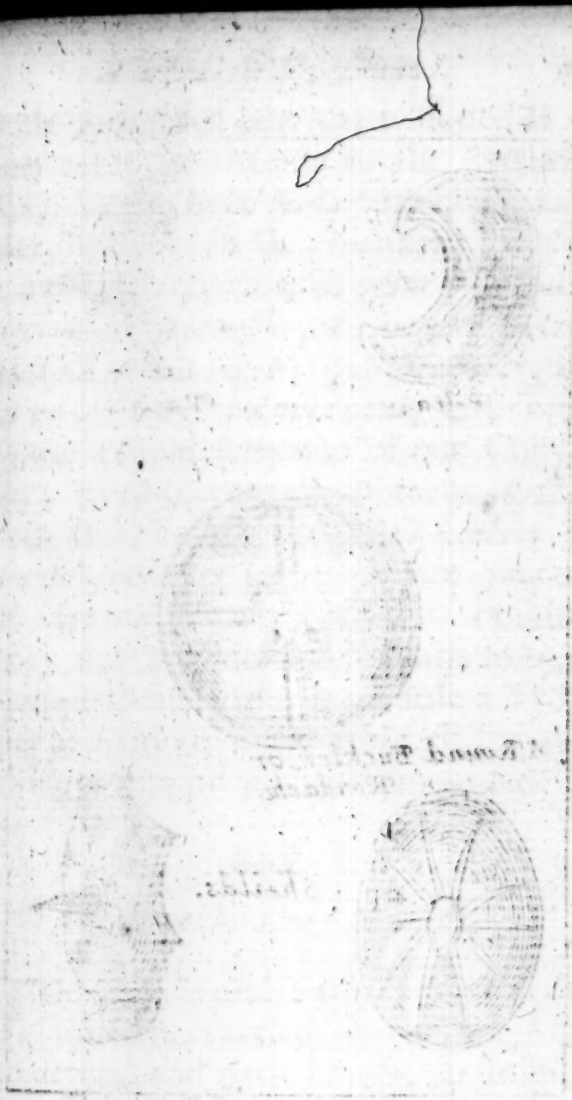
THe Souldiers of the Roman Miſitia, made to themſelves at firſt Stomachers or Breaſt-plates of unwrought Leather; according to *Varro de corio crudo pectoralia faciebant.* They had them afterward of Iron or Braſs;

Braſs; but theſe half Cuiraſſes were onely invented to hinder them from turning their Backs in Battel. The Generals made uſe of Corſlets of Guilt Leather, which covered them on all ſides. Some wore Coats of Mail, *Loricæ homatæ*, like to the Shirts which are ſtill in uſe; others had them of Iron or Braſs, which I cannot better compare than to the Shells of Fiſh. *Loricæ ſquammeæ*; for ſo *Iſidorus* calls them. *Squammea eſt lorica, ex laminis æreis vel ferreis concatenata in modum ſquammarum piſcis.*

None of all the Roman Infantrie, but the *Haſtarii*, the *Principes* and *Triarii*; were armed with Head-pieces, Cuiraſſes and Bucklers. The Velites, of whom ſome were Slingers, and others Archers, were onely lightly armed, that is to ſay, with a Buckler and Helmet of Leather.

The Cavalry was divided into the Light-Horſe; *Levis Armatura*, and the Gen-d'armes, who were called, *Equites Cataphracti*, becauſe they were armed from Head to Foot; and

rode



Pelta.

Parma.

A Round Buckler or Rondache

Sheilds.

rode on Barded and Capariſſoned Horſes, after the manner of the Parthian Cavalry, whoſe Armature is by *Suidas* deſcribed in this manner: *Lorica parthi equitis eſt talis prior ejus pars pectus, & femora, & manus extremas & crura tegit, poſterior tergum & cervicem & totum caput, &c.* That is the true deſcription of our Cuiraſſes, Head-pieces, Vambraces, Gantlets and Taſſes. *Armant autem equum ſimiliter ferro, totum quidem & vſq; ad ungulas.* In my opinion they did not do much amiſs ſo to equippe their Horſes; becauſe a Trooper in Armour is no more fit for any thing when once he is diſmounted.

Sect. 6.

Of Bucklers and Shields.

THe Shields and Targets which the Ancients carried on the left Arm to defend and parie blows, in imitation of the *Samnites*, who invented them, were convex, two foot and a half broad, and four foot long; ſome

with Angles, and others of an Oval Figure; but were all made of Willow or Fig-tree ſtrengthened with the Nerves and Sinews of an Oxe, on which was ſtreatched Linnen Cloath, and that afterward covered with a Bullock or Calf's Hide: the top, middle, and lower part were guarded with Plates of Iron, to reſiſt the Cuts of Shables, Stones, and Shafts that were darted or ſhot with violence.

Ovid in his *Metamorphoſis* tells us, that General *Ajax* had a Buckler covered with ſeven Skins.

—Clipei dominus ſeptemplicis Ajax.

The Grecian Pikes covered themſelves with Rondaches or round Bucklers of Braſs, and the Bow-men had onely Bucklers made of Oſier.

The Moors make uſe of Shields of the height of their Bodies, which they imbelliſh with warious painting.

The Bucklers which the Ancients called *Clipei*, differed onely from the Shield in that they were compleatly round,

round, and therefore the French have given them the name of *Rondach.*

The Spaniards and Africans wore Bucklers of Thongs of Leather, interwoven together, which they called *Cætræ*, as *Lucan* reports.

Illic pugnaces commovit Iberia cætras

The Amazonians made uſe of a Buckler in form of a Creſſant, which they called *Pelta. Ducit Amazonidum lunatis agmina peltis. Virgil.* In the Reign of *Numa Pompilius*, the Romans uſed little narrow and long Shields, which they named *Ancylia.* Heretofore, ſuch as began the profeſſion of War, carried only *Parmis*, or little White Bucklers, without any imbelliſhment; until that by ſome brave action they had ſignalized themſelves; then were they permitted to uſe greater, and to adorn them with the marks of their glorious exploits; from thence we have the Cuſtom of Arms which we commonly call *Scutcheons* or Shields

a Scuto, becauſe they are in reallity the Shields or Bucklers of Gentlemen, whereon they uſually carry a repreſentation of the brave Deeds of their Illuſtrious Progenitours.

The whole Armature of a Roman Souldier weighed no more than a Talent.

The End of the firſt Book

The Second Book.

OF

POWDER

AND

Artificial Fires.

CHAP. I.

Of Powder.

WE have had the Invention of Gun-powder from *China*, by means of the communication that a Monk named *Bertoldus*, had with the *Tartars*, in his Travels in *Moscovy*, about the year 1380. And therefore the Portugese were never so much surprized as when upon their accosting these unknown

known Countreys, they ſaw a great many Ships equipped and ranked in Bataillia, adorned with Streamers, Penons, and Ropes of ſeveral Colours of Silk; but their ſurprize augmented when they heard the Guns Fire: when they expected no ſuch thing. So that it is not true that the Monk was the firſt inventer of Gunpowder; he was no more but the publiſher of a Secret which he learnt from the Tartars, and which he had better kept to himſelf, without trying an experiment of it, that coſt him ſo dear, and which buried him in the Furnace which he himſelf contrived.

The Royal Prophet had reaſon to ſay, That we fall commonly into the ſnares which we have laid for others; the Authors of pernicious things, which tend onely to the deſtruction of their fellow Creatures, have always miſerably periſhed by the very ſame things whereof they have been the Inventers. We have beſides the example of that poor Monk, the inſtance

ſtance likewiſe of *Perillus* the Ingeneer of King *Phalaris*, who was the firſt that was burnt in the Brazen Bull which he had made for the puniſhment of Malefactors. *Arantius Paterculus*, was the firſt that was put into the Burning Horſe which he invented, by the order of *Æmilius Cenſorinus*, Governour of *Ægeſta* in *Scicily*; and *Engueran-de Marigny*, was the firſt man that was hanged in the Gibbet of *Mount-faucon*, which he cauſed to be erected at the Gates of *Paris*. Hiſtory is full of ſuch examples; but that I may return to my Subject, there is no doubt but that Powder hath been a diabolical invention, the effects whereof are no leſs dangerous than terrible, and thunder-claps are not more to be feared. Nevertheleſs, all that havock, all that noiſe, and all theſe overturnings, are onely cauſed by ſmall grains, whereof this is the compoſition.

The Compoſition of Gun-powder.

Take eight parts of Salt-peter, one part of Sulphur, one part and a fifth of Char-cole; pound them well together in a Mortar, with a Wooden Peſtle, ſprinkle thereon excellent Vinager or Brandy, and then reduce the maſs to a powder.

CHAP. II.

Of a Mine.

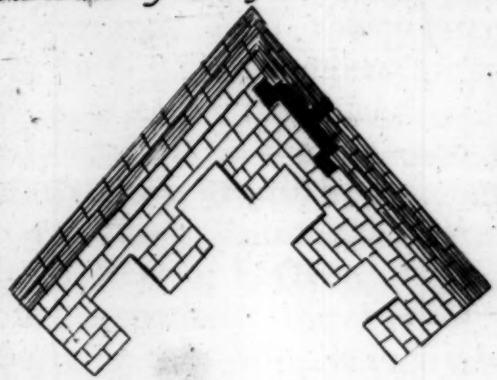
HAving ſpoken of Powder, I thought fit next to diſcourſe of its effects, and of the way how it is to be uſed for Mines and Artificial Fires.

When there is a deſign of blowing up the Baſtions of a Place beſieged, by means of Mines and *Fourneaus*, there is firſt a Gallery made over the Foſs or Ditch, thereby to communicate

Molets to put at the end of a Torch.

A Fire Arrow

The Wall of a Bustion with a Mine.



cate with the Baſtion, to which the Miner is to be ſet at work. The firſt thing a Miner does, is to cover the place where he deſigns to make his hole, with two ſtrong Planks, guarded with Plates of Iron to ſecure himſelf againſt every thing that may be thrown down upon him from the Ramparts. Next he makes his lodging upon one of the Faces of the Baſtion towards the point, three foot high, and about two foot broad. He digs and chambers, untill he reach the middle or farther into the Wall, to the end the Mine may work the greater effect; he digs and chambers alſo to the right and left in the thickneſs of the Wall, at leaſt ſix foot on each ſide, with the greateſt skill he can; and at the end of each Chamber he ſhall make a *Fourneau* or little Oven, according to the knowledge he has of the ſtrength of the Wall, in each whereof he puts between two and three hundred weight of Powder in Bags or Barrels, laying it as dry as he can upon Beds of Straw; afterward he places

places his *Sauciſſons*, which are a kind of Stockings or Caſes of Linnen Cloath, an inch in diameter, filled with Powder, and whereof the end reaches to the Mouth or Entry of the Mine; and becauſe by theſe *Sauciſſons* the Fire is to be given to the Powder of the *Fourneaus*, the Miner ſhould cover them with Tiles or Planks of Wood to ſave them from being ſmothered: Next he is to ſhut the hole with good pieces of Wood, well propt and ſupported, to hinder the flaſhing out of the Fire, he is likewiſe to faſten all with a great many Flints and hard Stones, made in form of a Swallous-Tail, that they may ſtick cloſe and not eaſily give way, when the Powder ſhall do its effect; if by chance he meet with countermines, which are to be found in many Baſtions, he muſt chamber over them, and leave between them and his Mine a ſufficient thickneſs to keep them from venting, and being made uſeleſs by the countermines.

When a Mine is made in a place where

where the earth is ſoft and yielding, the Ground is to be ſupported by Planks underpropt with little Poſts or Girders, as faſt as the Chambers are wrought.

The Ancients made uſe of Mines or Subterranean wayes, but their deſigne was very different from ours; they made them onely for a paſſage to go to the Sap, or to enter Towns, when our Mines are intended to bow up and overturn the face of the Baſtion.

CHAP. III.

Of Artifical Fire-Works.

Sect. 1.

Of the Fuſe.

THe Fuſes that are made for Petards, Bombes, hollow Bullets and Granado's, ought to be ſlow, otherwayes theſe Pieces would do their effects before the time. This is the manner of the compoſition of Fuſes:

Fuſes. Take three parts of Powder: ſix of Sulphur, and nine of Salt-peter, beat them apart into a ſubtile Powder, then mingle them altogether with a ſmall Stick in a Platter or Charger, pouring thereon by degrees the Oyl of Peter, until all be made into a Paſte; let it be dried in the ſhade, and the Fuſes charged therewith.

Sect. 2.

Of the Sulphur Match.

THe Sulphur Match is no more but Cotton made into Wicks, which are firſt ſteeped in Brandy, and then in molten Sulphur, and afterward dried in the ſhade.

Sect. 3.

How to make the Quick-match.

TAke half a quartern of Powder, a quartern of Salt-peter, two ounces of Brandy, half a ſeptier or the fourth part of a French pint of Vinegar, and a French pint of Urine, melt

melt all theſe together, and when they are diſſolved, put therein Cotton drawn out into groſs Threads: when the Cotton has drank up all the warm Matter, take it out whilſt it is moiſt, and role it up into little Matches or Cords two, three, or four foot long, with the hand upon a Table beſprinkled with the duſt of fine Powder; then ſtretch them out to dry in the ſhade; and keep them in a dry place: that Quick-match is very violent.

Sect. 4.

How to prepare the matter of Fire-Rockets.

TAke one part of Common Sulphur, melt it in an Earthen Pot, when it is diſſolved put thereunto half a part of groſs Powder very dry, three fourth parts of a part of Salt-peter, and half a fourth part of the Powder of Char-cole; mingle all theſe materials together leiſurely, and when they are well mingled, pour them on the Floor,

Floor, and this is the matter of Fire-Rockets.

Sect. 5.

How to charge Fire-Balls.

WHen one has a mind to charge Bombes, hollow Bullets, Fire-pots, and all ſorts of Fire-balls; let him take one part of the matter of Fire-rockets, one part of Salt-peter, the eight part of a part of Camphire, and as much fine Powder, mingled therewith with the hand, and put all into a hollow Bullet with quick Match.

Sect. 6.

How to make a Fire-Lance.

TAke a piece of light Wood three foot and a half or four foot long, bore it from one end to the other, and let the bore be an inch in diameter; make the Wood very ſmooth, both in the inſide and out-ſide, which ought to be an inch thick in all parts:

parts: Place into one of the ends a half Pike, which muſt enter half a foot into the Trunck, and be very well faſtned. The Trunck of the Lance muſt be wooped round with ſtrong Pack-thread, well waxed with Roſin and melted Wax to defend it againſt Water. The proportion of the mixture of the Powders is twelve parts of Salt-peter, ſix of Sulphur, ſix of Canon-powder, ſix of the duſt of Lead, two of Glaſs beaten but indefferently ſmall, two of Quick-ſilver, and one of Salarmoniac; when all theſe Materials have been beaten a-part, they are to be mingled together, and made into a Paſte, with the Oyl of Peter rather hard than ſoft: Put afterwards Hards into that Compoſition, and incorporate them therewith, and make thereof Pellets, or ſmall Balls ſuited to the bigneſs of the bore of the Lance, which aro to be dried and tied up with fine Wire. To charge the Lance, put into the bottom of the Trunck a charge of beaten Powder, without ramming it, but very little; o-

ver

ver that put a Pellet, with a little of the Compoſition, renew that until the Wood be full, ſtill encreaſing the Charges of the Powder; ſo that the laſt Lay contain two Charges. Fire is to be ſet to this Lance, with a quick Match at the mouth.

Sect. 7.

How to make Tourteaus to ſhew Light, or Port-Lights.

TAke twelve pounds of black Pitch, ſix pounds of Suet, ſix pounds of Linſeed Oyl, ſix pounds of Colophonia, and two pounds of Turpentine, in which ſteep Arquebuſh Match until it have drank up all the Matter, and be incorporated therewith, then make it in *Tourteaus*.

Sect. 8.

Of Burning Fagots.

TAke Fagots and rub them with the matter of the Fire-rockets, or otherways with Turpentine, or ſteep them

them if you pleaſe in melted Pitch; afterwards put Fire to them, they not onely give light in the Ditches, but ſerve likewiſe to burn the Galleries, that the Enemies may have made there.

To make ſtuffed Fagots for burning the Croſs Works, take Fagots ſteeped in Liquid Pitch, and ſtuff them with Granadoes; let them be lighted and thrown down from the Ramparts upon the Galleries, and the Granadoes take Fire inſtantly, and give ſuch claps on all hands as ſuffer not any man to come near to quench the Fire.

Sect. 9.

Of Fire-Hoops.

FIre-hoops are very proper for the defence of a Breach, by rolling them down upon the Enemies when they mount the Aſſault. This is the way of making them, which I have learnt of a very skilful Artiſt.

Take three large Hoops, tie them together, furniſh them with Artificial Fires, and with a dozen

and half of Common Granadoes, which you are to tie to the in-ſide of the Hoops, with good Wire, that thoſe which play firſt may not break off the others; put Fire to the Wild-fire, juſt as you role down the Hoop, the Granadoes will take Fire of themſelves and do cruel execution.

Sect. 10.

How to charge Granadoes.

TAke a pound of Salt-peter, ten ounces of *Sulphur*, ſix ounces of fine Gun-powder; pound them together, with two or three ſpoonfulls of Brandy, and a little Camphire; and Granadoes that are ſo made are excellent.

Sect. 11.

How to make Artificial Fire-works, that burn under Water.

TAke Tar, Sulphur, Camphire, Colophonia, Turpentine, Roſin, Quick-lime, Lintſeed Oyl, of each a pound, incorporate them together with

with a French pint of Brandy, and half a Septier of Aqua Fortis; put them into a Barrel, to which add if you pleaſe, charged Granadoes, Pommels of Swords, Piſtol-Barrels, charged with Powder and Shot; ſet Fire to all at the Bung-hole, with a ſlow fuſe; throw that Engine upon what you pleaſe, you will ſee it burn, even under water, and no man dares approach it to quench the Fire. The Carcaſſes which have been lately invented produce the ſame effect.

Sect. 12.

Of Proviſion for Artificial Fire-works.

THe Arſenals and Magazines of Frontier places, ſhould not onely be provided of Arms and neceſſary Inſtruments for the defence and attacking of Towns, but likewiſe of all Ingredients fit for the Compoſition of Fire-works; and therefore Proviſion ſhould be made of Salt-peter, Charcole,

cole, Camphire, Sulphur, Pine Roſin, Oyl of Peter, Lintſeed Oyl, Oyl of Aſpick, Tar, Venice Turpentine, Aliquitran of *Spain*, Black Pitch, Grecian Pitch, or Colophonia, Spaniſh Pitch, Wax, Tallow, Varniſh in Grain, Maſtick, Salarmoniac, Common Salt, Quick-Silver, Vitriol, Brandy, Aqua Fortis, Vinegar, Frankincenſe, Duſt of Lead, pounded Glaſs, of all ſorts of fat and dry Woods, Hemp, Ship-Pitch, Burning Balls, Granado's, Burning or Fire-Hoops, Lances and Fire-Trunks.

CHAP. IV.

Of the Roman Fire-works.

THe Romans, as well as We, made uſe of Fire-works, and amongſt others of thoſe they called *Malleoloi*, which were Arrows of Canes, encompaſſed with Pitched-Tow,

Tow, to thoſe they put Fire, and inſtantly threw them againſt the Engines of the Enemies, which they quickly burnt, unleſs the Fire was put out with Duſt, there being no other way to quench it; and our Fire-Lances or Trunks do very much reſemble them both in ſhape and operation. They were beſides accuſtomed to fill Earthen Pots with Pitch, Sulphur and Tow, to which having ſet Fire, they threw them with Slings into beſieged places: The flame of theſe ſpread on all hands and conſumed every thing it met with.

They made uſe alſo of Torches of Roſin, at the end whereof they had ſhard-pointed Iron-Heads, like to the Rowels of Spurs, which faſtned in the Engines, that the Fire of the Torches might the more eaſily conſume them. *Infixæ inhærenteſque Machinis facile eas concremabant.*

Beſides the Fire-Works which they ſhot out of Croſs-Bows, they likewiſe threw upon thoſe who mounted an Aſſault, Boyling-hot Oyl, Pitch, Melted Lead, Hot Water, Godrons or Ship-Pitch, Lighted Torches, and ſeveral other burning materials, as *Cæſar* affirms. *Picem re liquaſque res, quibus ignis excitari poteſt fundebant.*

THE

The Third Book OF War-Engines.

AMongſt War-Engines, we reckon all Pieces that ſerve to overthrow and ruine the Enemies Works, and facilitate the taking of their Places. It is my deſign to ſpeak of every Piece particularly; yet I have thought that I ſhould not ſwerve much from my Subject, if I began this third Book by a Chapter of the Caſting and Framing of Pieces of Artillery.

CHAP. I.

Of the Caſting and Framing of Pieces of Artillery.

IN caſting of Pieces of Artillery, there is commonly allowed for every hundred weight of fine Copper, Twenty pound of Metal; by Metal I underſtand Bell-Metal.

In defect of this Metal the fineſt Tin is uſed; and then for every hundred weight of fine Copper, there muſt Ten pound of the beſt Tin be allowed; or otherwayes Ten pound of Lattin, and Eight of the fineſt Tin; but becauſe the Caſting of Pieces cannot be without ſome loſs; for every Six pounds of Metal, there is a pound allowed in over-plus.

Founders ſhould have a ſpecial care of the preparing and mixing of the Metals, as well as of the internal ſmoothneſs and neatneſs of the Pieces, and therefore they ought to chuſe the moſt

moſt proper Materials, and take heed that the Clay of the Moulds be good, well beaten and wrought as they ought to be with Flocks and Hair, that the Moulds and all that the Piece is caſt upon, be well greaſed with Tallow, well bound and banded with Iron, well baked and prepared, well placed and laid, that the Tronions be ſo exactly ſet, that the Piece may be almoſt in an equal balance, weighing as much in the Chaſe as in the charged Cilinder and Breech; ſo that a ſingle Man may eaſily either raiſe or let her down in her Carriage.

A Piece muſt be alwayes ſtrong at the place of the Tronions, becauſe there is the greateſt ſtreſs, and the beginning of motion.

A Piece muſt be well repaired, tryed, and proved before ſhe be mounted on her Carriage; and care muſt be had that there be no Cracks, Flaws, Crevaſſes, nor Honey-combs in her Cylender or Chace, which commonly happens when the Metal is run too cold, when the Mould is not well tempered,

tempered, or when the Tin is not well mingled and incorporated as it ought to be.

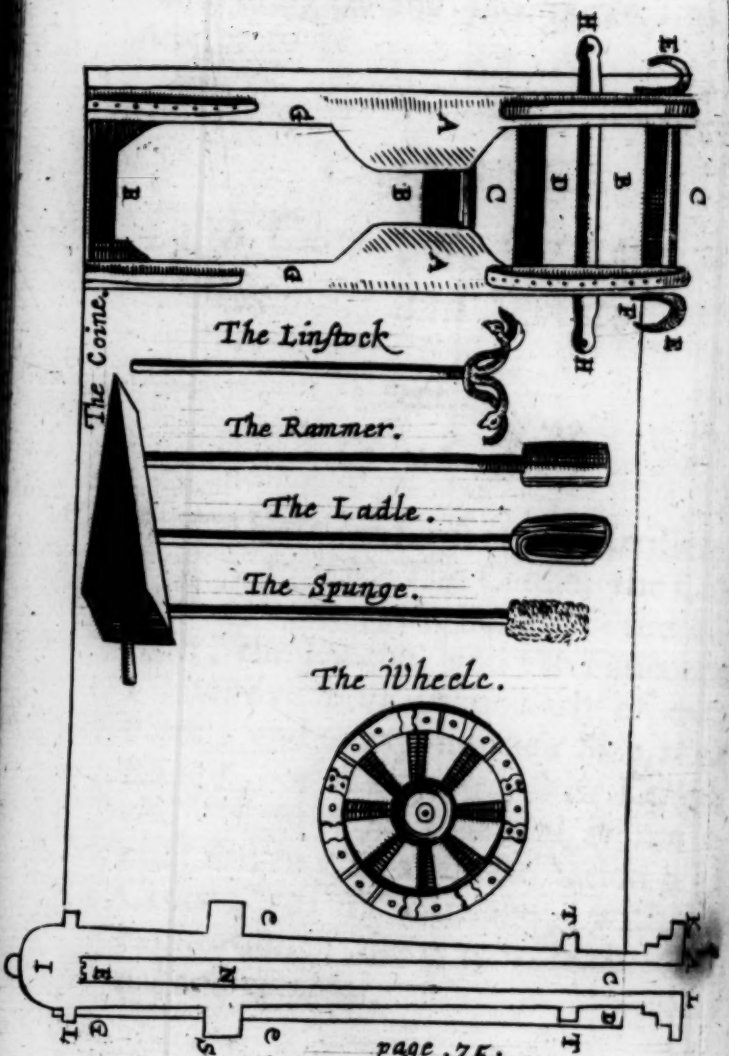
CHAP. II.

Of a Canon, its Carriage, its Utenſils and Service.

Sect. 1.

Of a Canon.

THere are ſix ſizes of Artillery, to wit, The Canon, the Culverin, the Baſtard, the Minion, the Faucon, and the Fauconet. I intend to ſpeak particularly of each Piece, and to explain their Size, their Range, or Carrying, their Length and Weight; but I judged it not amiſs firſt to give a repreſentation of a Canon, and its Carriage, with an explication of theirs parts both internal and external.


The Coine.
The Linstock
The Rammer.
The Ladle.
The Spunge.
The Wheele.

The Explication of this Figure.

A B, The diameter of the Bore or Mouth of a Canon is ſix inches and two *lignes.*

C D, The thickneſs of the Sides and Metal, two inches.

E G, The thickneſs of the Metal at the Breech, ſix inches.

E B, The whole Chaſe nine foot long, and the Cylinder all of the ſame largeneſs.

R S, The Tronions ſix inches in diameter.

K, The Murrion or Moulding of the Muzzel.

N A, The Chace of the Gun five foot and a half long.

N X, The Chamber or charged Cylinder in length four foot and a half and three *lignes.*

L, The Baſe Ring.

E X, The Breech.

T T, The Corniſh Ring.

e e, The Re-inforce Ring, diſtant from the Mouth four foot and a half, and from the Trunions half a foot..

I, The Touch-hole.

Sect.

Sect. 2.

Of the Charge of a Piece.

THe Powder for the Charge of any Piece whatſoever, is a third part of the weight of the Bullet, and the Ladle of each Piece ought to be made in ſuch a manner, that it contain exactly the quantity of Powder that is neceſſary for the Charge. A Piece that has juſt fired ſhould never be charged again, untill it be firſt cooled with Water, which does as well as Vinegar, which was heretofore uſed, and which is at preſent thought fitter for Sallades.

Sect. 3.

How to level, or bring a Gun to paſs

EVery Piece in a Battery muſt have its neceſſary Utenſils, its Magazine, Men to traverſe and ſerve it, and a Gunner to level it, guiding his ſight from the Breech to the Muzzel, which he cauſes to be raiſed or made lower,

lower, according as he judges convenient, by advancing or drawing back the Coins that are under the Breech.

Sect. 4.

Of the Ammunition and Utenſils of a Canon.

WHen Pieces of Artillery go into the Field, they are always attended with Wagons which carry their Ammunition.

Wagons drawn by four Horſes carry each a thouſand or twelve hundred weight; one Wagon carries Thirty three Canon Bullets, there are therefore required ſix Wagons and twenty four Horſes for the Carriage of the Ammunition that a Canon may ſpend in a day, which is a hundred Bullets, and two thouſand four hundred weight of Powder.

A Canon muſt likewiſe have its Ropes and Tackling, a Cable fifteen fadom long, four inches and a half about, threeſcore ten pound in weight, and other ſmaller Ropes and Tackling which

which are known to all Artists, and those that belong to the Artillery.

The Utensils belonging to Pieces, are the Spunge, which is a long Staff, the end whereof is covered with Wooll, and serves to cool the Guns; an Iron Ladle to put the powder into the Piece, the Rammer to ram down the Charge, and Leavers or Handspakes to re-place the Gun into the Port-holes or Gaps after she hath fired.

The Linkstock, which is a Staff of the length of a Cane, the end whereof is furnished with a kind of double Musket-lock; wherein is put a Match lighted at both ends.

The Coins or Quoins, which are properly great Wedges of Wood, with a peg or pin that serves them for an handle to thrust them forward or pull them back, according as the Gunner shall direct. The Figure will represent all more intelligibly.

Sect.

Sect. 5.

Of the Carriage of a Gun.

THe Carriage of a Canon consists of two sides, in length fourteen foot and a half, half a foot thick, and a foot and eight inches broad, the Carriage in the Timber towards the head, is thirteen inches broad, and at the end eighteen.

The Axel-tree is seven foot long, and the Wheels, if they be shod, are five foot high.

A A, The Sides of the Carriage.
B B, The Length of the Carriage.
C C, The Body of the Carriage.
D, The Axel-tree.
E E, The Drought-Hooks.
F F, The Cape-squares.
G G, The Iron Bands at the end of the Carriage.
H H, The Ends of the Axel-tree.
I, The Wheel of the Carriage.

CHAP.

CHAP. III.

Of Pieces of Calibre or Size.

Sect. 1.

Of the Canon.

THe Canon of *France* is in length about ten foot, its Carriage fourteen, and being mounted on its Carriage nineteen. The breadth on the Axel-tree is ſeven foot, its Metal weighs Four thouſand eight hundred weight, the Bullet thereof is ſix inches in diameter, and weighs thirty three pound and a third part; it carries blank about ſeven hundred common paces, three foot a pace, or three hundred and fifty fathom. The ſame piece may be fired an hundred times in one day.

The Bed of a Canon ought to be fifteen foot broad, and twenty in length, for its recoiling; for that end there is uſually made a ſtrong Floor of good Oaken

Oaken Boards, which floaps a little towards the Parapet, that the Canon may not recoil too much, and that it may be the more eaſily again traverſed into its place.

Sect. 2.

Of the Culverin.

THe *Culverin* is a foot longer than the *Canon*, and being mounted on its Carriage, is nineteen foot long, and on the Axel-tree ſeven foot broad. The weight of its Metal is Three thouſand ſeven hundred weight, the Bullet of it is four inches and ten *lignes* in diameter, and weighs ſixteen pound and a half. Its reach is three hundred and fifty fathom, and may be fired an hundred times a day.

Sect. 3.

Of the Baſtard Canon.

THe Baſtard is nine foot long, mounted on its Carriage ſixteen, and on the Axel-tree ſix foot broad; it weighs

two thouſand five hundred weight; its Bullet is three inches and eight *lignes* in diameter, and weighs ſeven pound and a half: It carries about a thouſand paces, and may be in one day fired an hundred and twenty five times.

Sect. 4.

Of the Minion.

THe *Minion* is eight foot in length, mounted on its Carriage ſixteen, and ſix foot in breadth; the Bullet is in diameter three inches and three *lignes*, and weighs two pounds three quarters: it carries not ſo far as the Baſtard, but may be fired in one day an hundred and fifty times.

Sect. 5.

Of the Faucon.

THe *Faucon* is near ſeven foot long, on its Carriage eleven, and five and a half broad. It weighs eight hundred weight. The Bullet of it is two

two inches and ten *lignes* in diameter, and weighs a pound and a half; it may be fired in one day an hundred and fourſcore times.

Sect. 6.

Of the Fauconet.

THe *Fauconet* is near five foot long, mounted on its Carriage nine and a half, and four foot and a half in breadth. The Metal thereof weighs ſeven hundred and forty weight. Its Bullet is an inch and ten *lignes* in diameter, and weighs three quarters of a pound and a half. It carries two hundred and fifty fathom, and in one day may be fired two hundred times.

Fauconets are commonly planted in low places, or on the Flancks of Baſtions, for ſcouring the Ditches and ruining the Galleries. A low place whereon are two Canons planted, is commonly ſix fathom ſquare.

Sect. 7.

The Effect and Execution of the Canon.

THe Pieces of Artillery which are moſt frequently uſed to ruin and demoliſh the Works, are ſuch as carry Shot from thirty to forty five pound weight.

A Canon Shot at two hundred paces, or a hundred fathom diſtance, may pierce between fifteen and ſeventeen foot into ground that is but indifferently ſetled, ten or twelve foot into ground long ſetled and well faſtened; two or three and twenty foot into ſand or looſe ground; and a Canon fired to purpoſe againſt a Groundwork, within the diſtance that I have been ſpeaking of, will ruin more than can be repaired with fifty Baskets full of Earth.

The force of a Canon Shot from low to high, or from high to low, or on a level, is equal, as to the Canon; but in reſpect of the Body which receives

receives the Shot, that which is fired from a low ground to a higher, ſhakes and over-turns more.

Sect. 8.

The Way of Nailing up a Canon.

BEſieged make ſometimes Salleys out to Nail up the Canon; and attempt the Batteries; and whilſt ſome throw down the Parapets, others break or burn the Carriages, ſome drive in a Nail of Steel which is hacked and notched, and break it in the Touch-holes of the Pieces, which afterward are good for nothing but to be caſt again.

CHAP. IV.

Of Mortar-Pieces, Arquebuſſes a Crock, Bombes, Bullets, the Carcaſs, &c.

Sect. 1.

Of Stone Guns.

STone Guns are for moſt part of Iron, much of the ſhape of Mortar-pieces that ſhoot Bombes. They carry not far, and therefore are not uſed but in fortified places, to incommode the Beſiegers when they make their approaches; the powder for the Charge is regulated according to the number of ſtones and pieces of Iron that are put into them; and they are commonly filled up to the Mouth.

Sect.

Sect. 2.

Of the Arquebuſs a Crock.

THe Arquebuſs a Crock is made of Iron, in form of a great Musket. It may be fired three hundred times a day; which comes to five and twenty ſhot an hour. The Bullet of it weighs three ounces, and the Charge of Powder an ounce and a half.

Sect. 3.

Of Mortar Pieces.

MOrtar-Pieces are of Iron or of Caſt Metal, and ſerve to ſhoot Bombes, they are not ſo long as Stone-Guns, and their Bore is wider or narrower, according to the bigneſs of the Bombes which they are to contain; their Carriages have no Wheels, and are quite otherwayes ſhaped than thoſe of a Cannon; as may be ſeen in the Figure.

Sect. 4.

Of Bombes.

BOmbes are of a late Invention, and were never uſed in *France* before the year 1635 at the Siege of *Dole*. They are made all of Iron, and are hollow, with two handles to carry them by; but they are not all of the ſame ſize, nor of the ſame ſhape: ſome are round and others long. The firſt are called Bombes and the other Fire-pots. They are filled with Fire-works and Powder, and then are ſtopped with a Bung or Stopple well cloſed; in the middle of which is left a hole to apply the Fuſe to.

When Bombes are to be ſhot, a convenient ground is choſen, not too far diſtant from the place which is intended to be galled; and there, a Platform is erected, which is provided with Plancks of Timber, on which the Mortar-pieces are planted.

Before a Bombe be put into the Mortar-piece, there is thrown into the bottom

bottom of it a Charge of Powder proportioned to the weight of the Bombe, which is laid above the Bung-hole aloft.

So ſoon as the Mortar-piece is charged, the Artiſt takes his heights and meaſures, that the Bombe may directly fall into the place that he intends; that is to ſay, he gives leſs or more elevation to his Mortar-piece, according as he is near or diſtant from the place and ſtops it either with a Coin, or with an Iron Pin, which he thruſts croſs the Carriage; that being done, he ſets fire to the Fuſe of the Bombe, and then to the Powder of the Mortar-piece, which forces out the Bombe and carries it up in the Air: when it is come to its full reach, it falls and breaks in a thouſand pieces. The ſhivers and pieces of it break and bruiſe every thing they meet with, and the Fire-works that are within it, ſet fire in all places where it chances to fall. Nothing gives greater terror to the Towns-people of a Beſieged Town, than Bombes; and the ravage that there

there they do is ſo extraordinary, and ſo gall Men, Women, and Children, that they know not where to be in ſafety.

Sect. 5.

Of the Carcaſs.

THe *Carcaſs* is a Warlike Engine of very late Invention, or rather it is a late Imitation of theſe Burning Barrels, that keep fire under water; whereof I have ſpoken before, in the *Book of Powder* and *Chapter of Artificial Fire or Fire-works*, and which takes its name from the Figure, becauſe it is made of two hoops of Iron two inches broad, and two *lignes* thick, croſſed oval-wayes, and is filled with a Bag of Pitched Canvas, ſtuffed with Granadoes, and ends of Muſket Barrels charged with ſmall Iron ſhot.

Carcaſſes are ſhot out of Mortar-pieces, in the ſame manner as Bombes, and the Fire they make laſts above half an hour, no body daring to put it out.

Sect.

Sect. 6.

Of the Granadoe.

THere are Granadoes of all ſizes, but thoſe which are uſed by our Granadiers are all almoſt alike, and are commonly two inches and a half and two *lignes* in diameter. They are charged with Powder within a finger of the Hole, the reſt is filled with hard preſſed Tow, and then the Hole is ſtopped with a Bung of Wood made very cloſe; in the middle whereof is left a little hole or vent, through which is put a Fuſe or Wild-fire of Fine Powder mingled with *Aqua vitæ* or *Brandy*. Granadoes are thrown with the hand, and muſt not be held long after they are fired. They are commonly uſed to drive Enemies from Trenches, in a Covered Way and in a Lodging.

The Granadoes break ſo ſoon as the Train is ſpent, and their ſhivers and pieces wound all they hit.

Sect.

Sect. 7.

Of Hollow Bullets.

WE have at preſent long and hollow Bullets, which are filled with Powder, and put into Guns as the others are; all the difference betwixt them is, that they work a double effect; they perform in the firſt place that which Plain Bullets might do, and beſides they burſt and break in the hole that they have made, either in a Wall or in a Ground, and blow up as much earth or as many ſtones as a ſmall *Fourneau* might; and in this manner they are charged: When theſe Bullets are filled with Powder, their Vent or opening is ſtopped with a Bung, wherein is left a paſſage for a Fuſe; to which afterward is put a Sulpher Match, by which the fire of the Gun is communicated to the Train of the hollow Bullet at the ſame time that it is forced out of the Piece.

Sect. 8.

Of Red Bullets.

OTher Bullets are likewiſe made uſe of, which the French call *Red Bullets*, becauſe they are made red hot, before they are put into the Canon. Their effect is to burn what they meet with, but that ſucceeds not alwayes.

Sect. 9.

Of Cartouches.

CArtouches may be called Boxes of White Lattin, half a foot deep, and ſized to the Bore of the Piece, which are filled with great Musket Bullets, that ſcatter as they come out and ſpread abroad on all hands.

Canons are ſometimes charged with Nails, Pieces of Old Iron, and Chains with Bullets faſtened to their ends.

Canons charged with Cartouches carry not ſo far, as when they are charged

charged with Bullets; but they do greater havock, eſpecially in Approaches.

CHAP. V.

Of Petards, and of the Way how they are to be uſed.

Sect. 1.

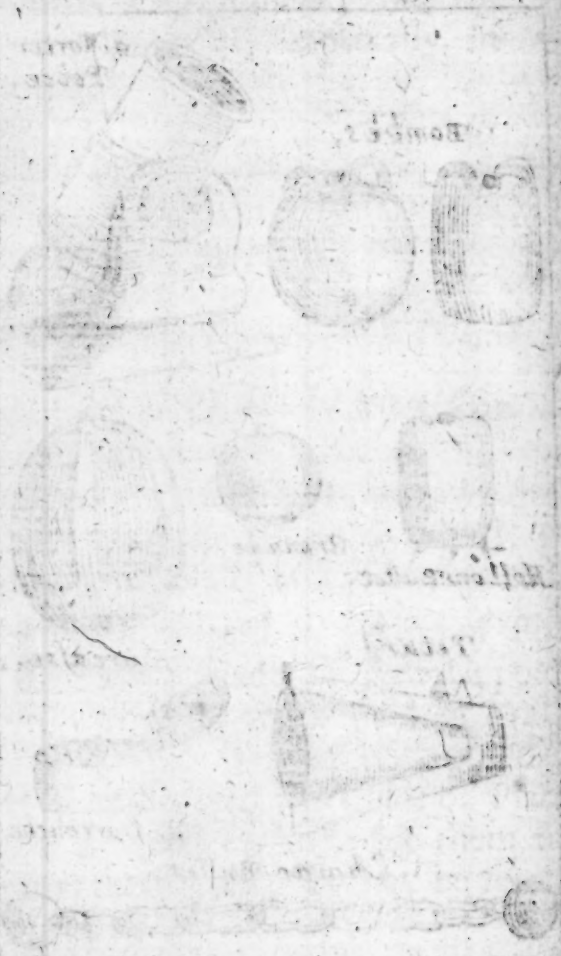
Of Petards.

THE Petard is a kind of Fire-pot, made of Red Copper, with a tenth part of Braſs, which is filled with powder, and is applied to the Gates of Places upon a Surpriſe, to break them and throw them back; as may be ſeen in the Figure.

The Petard of a Bridge ought to be twelve inches long, and without the Breech ſeven inches and a half wide, and within five. The Metal at the Breech

a Morter Peice.
Bombes.
Grenade.
Hollow Bullet.
Carcaſse.
Petard.
Cartouche.
Chaine Bullets.

page, 94.



Breech ought ro be fifteen *lignes* thick, and ſix at the Muzzel, without reckoning the Murrion or Moulding; it hath ten inches in Bore at the Mouth, three Handles, and the Fuſe joyning to the Breech. The Metal of it weighs from threeſcore to threeſcore and ten pound weight, and is charged with five or ſix pound of Powder.

Petards of Gates with Croſs-bars, ought to be nine inches long, five *lignes* thick at the Muzzel, and an inch at the Breech; having ſeven inches in Bore, ſix without the Breech and four within; it weighs forty pound weight, and its Charge is from three to four pound of Powder.

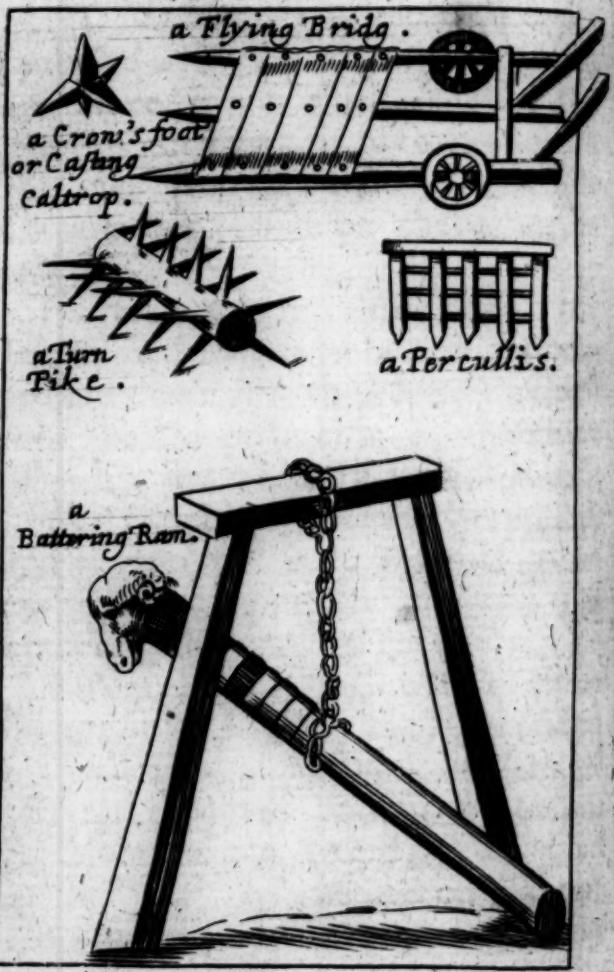
The Petard for Gates with Plain Bars or Paliſſadoes, ought to be ſeven inches long, at the Muzzel four *lignes* thick, and at the Breech nine; the Mouth four inches wide, without the Breech three inches and a half, and within two; it weighs about fifteen pound weight, and from one pound and a half to two pound of Powder, is the Charge of it. Be-

Between the Petard and Bridge is put a *Madrier* or Plank of Wood a foot and a half broad, two foot long, and three inches thick; when the Wood is not ſtrong, it is covered with Plates of Iron laid on the one ſide Croſs-wayes, and on the other in length.

Petards are to be charged with the fineſt Powder that can be had, knocked hard down into the Petard, which muſt be ſtopped with a Woodden Trencher or Woodden Roler an inch thick; which muſt be exactly applied, and whereon a little Waxe is to be melted for ſtopping the chinks, and hindering the water to enter.

A Petard is charged within three fingers of the Mouth, the reſt is filled up with Tow preſſed very hard; afterward a Canvas Cloth is put before the Mouth of the Petard, which is to be tied very faſt with a cord about the Muzzel, leaſt the Charge drop out.

The Fuſe ought to be ſlow, that the Petardier may have time to withdraw


a Flying Bridg.
a Cron's foot or Casting Caltrop.
a Turn Pike.
a Portcullis.
a Battering Ram.

draw before the Petard plays. The manner of the compoſition of the Fuſe is to be found in the *Chapter of Fire-works*, *Book* 2. *Chap.* 3. *Sect.* 1.

Sect. 2.

Of the Arrow and Flying-Bridge.

PEtards are applied to a Bridge with an Arrow made in the manner following:

The Arrow ought to have a weight or counterpoiſe behind, it is mounted on two Wheels three foot and a half high, and two foot and a half thick. The point of the Arrow ſhould be at leaſt a foot wide, that it may contain the Petard.

The Arrow is compoſed of three Planks twenty ſix foot in length, each Plank made up of four Pieces, which are faſtened together with Iron Rings, and are taken a ſunder that they may be portable, and are joyned again with an Iron Pin. Theſe three Planks are made faſt together by Barrs an inch thick, two inches broad, and a foot diſtant from one another. On

one of the Planks is made a hollow Crany to lay a Train in, to give Fire to the Petard.

The Flying or Roling Bridge is made in the ſame manner as the Arrow, except that it is as broad at one end as at the other, and that it is covered with Planks; as may be ſeen by the Figure.

Sect. 3.

The Way of Uſing and Applying a Petard.

WHen there is a deſign to petard a Gate; the Scituation of it is firſt to be viewed, and when a day is pitched upon for the execution, the Petards, Inſtruments and neceſſary Utenſils are loaded on Mules; Detachments are made, and every one is ordered what to do; all things being well diſpoſed, they march out in good order about the evening, that by midnight they may arrive in the neighbour-hood of the place which is intended to be ſurprized. The Mules are unloaded

unloaded half a quarter of a league from the Gate, and every one takes hold of the Tools whereof they are to make uſe. The Petardier makes him that carries the *Madrier* march firſt; afterward he calls three for the Petard, two to carry it, and the third to help, if need be. If the Petard be faſtened to the *Madrier*, the four eaſe one another two and two by turns, and the two who carry not the Petard, have each of them a Smiths great Hammer: after them the Petardier commands two others to march, carrying each of them a great Hatchet; then another with a Goats-foot (or Fearn) another with a dark Lanthorn, another with three or four Pieces of lighted Match; and another with a Turrel or good Nails, and a Club, ſo that every Petard to be rightly ſerved, requires at leaſt ten men.

When a Petard is to be applied to a Draw-bridge, the Petardier makes the Flying-Bridge march firſt, or the Arrow with ſeven or eight Men, as well to carry as to puſh them. Next he

makes the *Madrier* and the *Petard* advance in the ſame order as I have ſaid before; after follow thoſe who carry the Ladders, and the floor of Planks, to be thrown upon the Breach which the Petard may have made, who are followed by thoſe who carry the Hammers, Hatchets, Pinſers, and other Inſtruments to pull out the Barrs, and cut the Chains. There is need rather of too many Inſtruments, than that any one ſhould be wanting; and when the Petardier asks any thing, he that carries it ſhould be ready at hand to give it without making the leaſt noiſe.

All things being thus diſpoſed, the Petardier covers himſelf with a round Buckler, or ſome Planks made on purpoſe to ſecure him from Musket-ſhot, or Fire-works that may be thrown upon him; he applies his Petard, commands thoſe that are to fall on to be in readineſs, ſets Fire to the Fuſe, and with-draws whilſt the Petard is playing; ſo ſoon as a Breach is made, thoſe that are commanded for the

firſt

firſt bruſh, enter the place, and force all that reſiſts them; they who are to back them, do as much, and ſo ſucceſſively do all who have any thing to put in execution.

Sect. 4.

Of Tortoiſes.

WHen a Bridge joyns ill to a Wall, it may be beaten down without a Petard, with a Brazen Tortoiſe placed between the Wall and the Bridge, which by its ſhivers and pieces breaks it. This is the way of making it: Take two ſhells of Braſs five inches deep, a foot wide, and two inches thick; place the one upon the other, and fill them with powder, putting thereto a Fuſe.

We may reckon among our Engines of War, the *Herſes*, *Sarraſins*, or *Cataracts*, and the *Orgues*, which are great Pieces of Hanging Wood, and are let fall down thorow holes, when there is any fear of a Surpriſe, or of the effort of a Petard.

Turn-pikes, which are Beam ſtuck full of ſharp-pointed Piles, which roles upon a Pivot to ſtop a Paſſage.

The *Crow-foot*, *or Caſting Caltrop*, are Iron Pricks, made in ſuch manner, that what way ſoever they be turned they have alwayes the point upwards.

CHAP. VI.

Of the Warlike Engines of the Romans.

Sect. 1.

Of Machines or Engines in general.

WE call all things Engines, whereof the Art and Contrivance ſurpaſſes the matter, *Materiam ſuperabat opus*, ſays *Ovid.* From thence comes the Name

Name of *Ingeneer*. The Ancients called all things that ſerve to attaque or defend places, Warlike Engines; ſo does *Moſes* call them in the 20th Chapter of *Deuteronomy*, the laſt Verſe. *Onely thoſe Trees which thou knoweſt are not for meat, thoſe ſhalt thou deſtroy and cut down, and make Forts againſt the City that maketh War with thee, until thou ſubdue it.* All theſe ancient Engines were onely made of Wood pieced together and made faſt with Iron; which were placed upon the Turrets and Corners of the Walls, to throw Darts and Stones of an extraordinary bigneſs: Others there were onely for beating down of Walls, and others for Mounting an Aſſault, and for a Scalado.

Sect. 2.

Of the Tortoiſe or Teſtudo.

THe Tortoiſe of the Ancient Gauls which the Romans uſed, and called *Teſtudo*, was nothing elſe but the

crouding together of many Souldiers, who covered themſelves on the Head and Sides with a great many Bucklers. The former Ranks carried them higher than the following in manner of the Tiles of a Houſe; that ſo whatever might be thrown upon them from the Walls, might not ſtick, but more eaſily ſlide to the ground. *Homer* ſpeaks of theſe Tortoiſes in this manner;

Scutum ſcuto hæret, galeæ galea, atque vir viro.

They made uſe of that Invention for Scaling of Walls, by mounting one upon another; as *Titus Livius* deſcribes it. *Teſtudine parti muri ad mota, cum armati ſpuerſtantes ſubiſſent propugnatoribus, muri faſtigio altitudinis æquabantur.* *Tacitus* calls that Engine a reiterated Tortoiſe. *Super iteratum teſtudinem ſcandentes.*

They not only made uſe of theſe Tortoiſes in attacking of Places, but alſo in Battels; breaking through the Legions of the Enemy. All

All theſe Tortoiſes were not in this manner compoſed of Men and Bucklers; they had beſides certain Sheds of Wood twenty five foot ſquare, and covered with a Shelving Roof, which they called Tortoiſes, whereof ſome ſerved to cover the Lodgings, others to ſhelter the Workmen againſt Stones and Arrows from the Town, and others to hang the Battering-Ram, and cover thoſe who were to ſwing it; theſe were called *Teſtudines Arietariæ.*

Sect. 3.

Of Ladders.

THe Romans had Ladders of all Faſhions, which were alwayes two foot higher than the Walls they intended to ſcale. Some folded, and could with little inconvenience be carried any whither; theſe were called *Scalæ compactiles.* Others were called *Reticulatæ aut Stupeæ*, becauſe they were made with Cords provi-

provided at the ends with ſtrong Hooks, to faſten them with to the Walls. They had others that opened and ſhut in manner of *Zizack.* And others at the end of which was a kind of a little Watch-Houſe; whereinto they put ſome body to ſpie what was doing on the Ramparts.

They had beſides another kind of Ladder, which they termed Rolling Ladders; at the end of which were Bridges: and others which they called *Sambucæ*, which were carried in Boats, to ſcale Walls that were encompaſſed with Water.

Sect. 4.

Of Bulwarks.

WHen the Romans intended to attaque a place they cauſed Bulwarks to be raiſed round the Walls, which were in height twenty four foot, and in breadth three hundred; upon which they built Towers of VVood armed with Iron on all ſides; which

which commanded the Ramparts, and from which the Beſiegers threw upon the People of the Town Stones, Darts, Artificial Fire, that they might thereby facilitate the approach of the Battering Rams and other Engines for taking of Places.

Sect. 5.

Of Towers.

THe Towers which were uſed by the Romans in the attacking of Places, went on VVheels, were very high, and on all ſides covered with Plates of Iron, which rendered them more weighty, more difficult to be overthrown, and leſs obnoxious to the danger of Fire. Theſe Towers were invented by one *Diades* a Souldier under *Alexander* the Great; they had alſo other Towers which carried Bridges and Battering Rams. *Cæſar* cauſed to be built before *Marſeillis* Towers of Maſons Work five foot thick,

thick, and near the Towers of the Enemies, from whence he might incommode them, he cauſed moveable Roofs to be made for them, from which hung Skreens made of Cables or other Ship-ropes, behind which the Workmen might under covert labour in the raiſing of the Towers.

Sect. 6.

Of the Battering Ram.

THe original of Battering Rams which *Paulus Diaconus* calls, *Exterminatorium Inſtrumentum*, is very Ancient; ſome attribute the invention of them to the Greeks, and others to the Carthaginians. However it be, they performed in thoſe days what our Canon and Mines do at preſent, ſeing the onely uſe they were put to was to beat down the Walls of Towns which they intended to take.

The Battering Ram was made of a large Tree, like to the Maſt of a Ship, which was in length ſix and twenty cubits,

cubits, and five hand breadths in diameter, and within ſix cubits of the head was guarded with Iron Rings; the head was of a knotty Wood covered with Iron, and repreſented the Head of a Ram with Horns, and therefore the name of Battering Ram was given to that Engine. The Battering Ram hung betwixt great Beams of Wood, by Maſſive Iron Chains, and required a hundred men to ſwing and puſh it violently againſt the Walls. *Repulſus magna virorum manu*; ſays *Flavius*, The ſhape of it may be ſeen in the Figure.

Sect. 7.

Of Counter-Engines.

TO hinder Aſſaults and Storms, the beſieged made uſe of huge Stones, Wheels, Wagons with four Wheels filled with weighty Matters, Columns, Cylinders, Mill-ſtones, Tuns, and Artificial Fire, which they threw upon the Beſiegers and their Engines, with

with purpoſe to break them, or to reduce them to Aſhes. They hindered the effects of the Battering Rams, by oppoſing to them Packs of Wooll, or by catching hold of them with Snares, or Iron Engines made in form of Pinſers, which they called Woolves, meaning that ſuch Woolves could catch the Ram, becauſe with theſe Engines they drew the Battering Rams up, or broke them in the middle.

The End of the Third Book.

The Fourth Book OF ENSIGNS, TRUMPETS, AND OTHER INSTRUMENTS OF WAR.

IT may perhaps ſeem ſtrange, that I have comprehended in one and the ſame Book, and under one ſole Title, Enſings, Trumpets, and other Inſtruments of War, conſider ing the ſmall Analogy they have to one another. I frankly confeſs, that as to the Form there is none at all; but as to the Uſe and Property, I maintain there is a great deal. We call that a Sign whichmarks any thing to us, *Signum a ſignificatione.* Now Enſigns have onely been ſo called becauſe they ſignified to Souldiers their Camps, Marches, their Fields of Batrel,

tel, and the Places of their gathering together and rallying. Are not Drums and Trumpets the ſigns of notice and advertiſement? Do not the different Sounds of both the one and other ſignifie the different Commands which the Souldiers are to put in Execution, As to take Arms, come to their Colours, draw out into the Field, Charge, Retreat, and many other things which they underſtand by the ſound of thoſe Inſtruments: and therefore I thought it unneceſſary to ſeparate them from Colours, Standards, Enſignes and *Guidons*; whereof I ſhall treat in the following Chapters.

CHAP. I.

Of Enſigns.

THe Trojans were the firſt that made uſe of Enſigns in their Armies, that they might accuſtom Young Souldiers to know their Companies, and facilitate their Rallying,

Rallying, when they happened to be in a Fight. *Ut tyrones assuescerent signa sequi, & in acie cognoscere ordines suos.* Says *Livie.*

The Ancients in the beginning had no other Ensigns but Bundles of Hay which they fastened on long Poles: From whence comes the word *Manipule, a Manipulis Fœni,* by the report of *Ovid.*

Pertica suspensos portabat longa maniplos,
Unde maniplaris nomina miles habet.

But the mode of the Rustick and Wild Ancients lasted not long, the Roman Custom came in place of it; and then succeded ours which we at present carry, and which are different from the former; both in form and matter. We give them several names according to their various shapes: to wit, Colours, Standards, Ensigns, and Guidons.

The Foot carry Colours, which are of Taffata, an Ell and a half square, fastened to a half Pike eight or nine foot long.

Every Regiment has a particular Colour to it ſelf, except the Croſſes and the Collonels Colours, which are always White, becauſe White is the Colour of *France*, as the Black Eagles ſhew us the Colour of the Empire; the Red that of *Spain*, and the Orange that of *Holland*.

The Horſe carry Enſigns, Guidons, and Standards.

The firſt two are for the Troops of the Gens-d'arms.

Enſigns are above a foot and a half ſquare, and are made of Stuff embroidered with Gold and Silver, adorned with Ciphers and Deviſes, and faſtened to a Lance eight or nine foot long.

Guidons are longer than broad, of a Stuff like to that of Enſigns, divided in two points at the end, which are made a little round; their Lances are eight or nine foot long.

Standards are for the Troops of the Light Horſe, but a foot and a half ſquare, and of a ſtuff embroidered, furniſhed with the Arms and Deviſes of

of the Masters de Camp of the Regiments, and their Lances alike to those of Ensigns and Guidons. The Figures will more easily give you the meaning of what I say.

Sect. 1.

Of the Oriflamme.

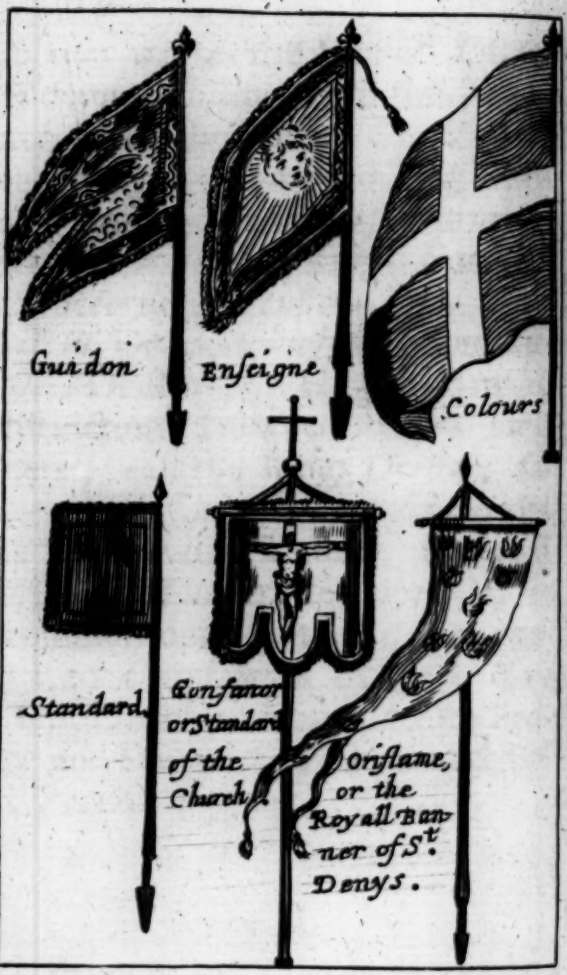
THE Royal Banner of *France*, to which the Flames of Gold, wherewith it was bespangled, have given the name of *Oriflamme*, was properly the Ensign General of the Kingdom, which never came out of the Church of St. *Denis*, where it lay in Custody; but when the Kings marched out to the Wars: It was made of a Red Stuff, about two foot long, pointed and cloven, like the Banderolle or Penon of a Ship, which was fastened to a Lance, in the manner of the Banners of the Church.

It was left off to be carried in the Reign of *Charles* the Seventh; and since that time, the *Oriflamme-bearer*, which was one of the Chief Officers

of the Kingdom, has remained extinct.

He that wrote the Life of *Lowis* the Young, diſtinguiſhes the Royal Banner, from the Banner of St. *Denis*; when he ſays, *That* Geoffry *of* Ranconay, *one of the nobleſt Barons of* Poictou, *carried the Kings Banner, which according to cuſtom came after that of St.* Denis, *which was commonly called* Oriflamme. They who make a diſtinction between theſe two Banners, call the Kings *Oriflor*, *Oriflour*, *Oriflamme*, *Karlir*, and make it of Azure Taffeta, ſpangled with Golden Flowers de Luce. It is the common opinion that it was preſented to *Charlemain* by Pope *Leo* the Third, when he made him Protector and Defender of the Church of Saint *Peter*.

Sect.


Guidon
Enseigne
Colours
Standard
Gonfanon or Standard of the Church
Oriflame, or the Royall Banner of St. Denys.

page. 117.

Sect. 2.

Of the Gonfanon.

THe Gonfanon is in the Church, what the Oriflamme was heretofore in *France*, and the Office of great *Gonfanonier*, is one of the moſt honourable charges of the Eccleſiaſtick State.

The Colour of the Gonfanon is Red, and differs not in ſhape from the Banners of the Ancient Cavalry, but that it is cloven into three ends a little rounded.

Moſt Kingdoms have their Enſigns or Standards General in imitation of the Romans, who had the Banner of the Conſul, or of the General of the Army, which they called *Labrum*, of a Purple Coloured Stuff, enriched with Fringes of Gold and precious Stones.

Sect. 3.

Of the Banner and Penon.

THe difference between the Banner and Penon was, that the Banner was ſquare, faſtened to a Lance like Colours and Cornets; and the Penon had a long Tail, which might be eaſily made a Banner, by cutting off the Tail. From theſe Penons is derived the name of *Penonages*, which has been given to the Companies of the Quarters of the City of *Lyons*, whoſe Captains are called *Captains Penons*. In *England* the Penon of St. *George* was the chief Banner of the Kingdom.

Every Lord carried his Arms in his Banner, or in his Penon; but none but Lords Banerets, were ſuffered to carry a Banner to the Wars. When a Lord having for many years carried Arms, had Eſtate enough to entertain a Troop of Gentlemen to accompany a Banner, he was

was allowed to raiſe a Banner; for that end he carried at the firſt Battel where he was, a Penon of his Arms, and preſented himſelf before the Conſtable, or him who commanded the Army for the Prince; from whom he asked leave to carry a Banner; and that being granted him, he took the Heraulds at Arms Witneſſes of it, who cut off the Tail of his Penon, and made a Banner thereof.

Princes, Mareſhals, and Barons, had their Banners having their Coats of Arms quartered on them, carried before them by Squires, to aſſemble their Men about them in day of Battel.

Sect. 4.

Of Banderolles; Pannonceaux, and Faillions.

THe *Banderoll* was a kind of little Banner, carried by Knights in Turnements, with which they made the ſign of the Croſs, when they

entered the Lists, before they began to Fight; as *Oliver de la March* reports in the Eighteen Chapter of his *Memoires*. When the King gives Holy Bread, the Swisses and Officers that serve at these Ceremonies, carry these *Banderolls* with the Kings Arms quartered on them.

Panronceaux were little Pennons, wherewith Ships, the Tops of Towers, and the Houses of Gentlemen of Quality, were beautified.

The *Faillion*, is a kind of Standard made use of in the Army, for assembling the Baggage, and every Regiment ought to have one of its Colour, which conducts the Baggage to the *Faillion* General.

CHAP.

The Enſigne of the Roman Horſe.

The Enſigne of the Manipule.

The Enſigne of the Roman Legion.

page. 121.

CHAP. II.

Of the Roman Ensigns.

THE Romans had one kind of Ensigns for foot, and another for Horse. Every Legion had its Ensign General, which was the Roman Eagle, as we have a Collonels Colours in every Regiment of foot, which is always of White Taffeta; besides that the Manipules or Companies had their particular Ensigns, which were silvered Pikes, at whose end was a little piece of Wood laid a thwart, in form of a Cross, with little Globes fastened down along to the Pikes, on which was the Names of the Emperours, as *Suetonius* reports.

Artabanus transgressus Euphratem aquilas & Romana, Cæsarumque imagines adoravit. (signa.

The Armies were reckoned by Eagles; as

as *Hirtius* ſays. *Erat Pompeii acies tredecem aquilis conſtituta.* To intimate that the Army of *Pompey* was compoſed of thirteen Legions. We have retained the ſame way of expreſſing the number of the Horſe, which we have in our Armies; for inſtance we ſay, The King hath detached or ſent into the Field, two hundred Cornets, to ſignifie two hundred Troops.

The Enſigns of the Cavalry were of a ſhape different from thoſe of the Infantry. The Romans named them *Vexilla*, which to ſpeak properly were little ſquare Sails, almoſt of the bigneſs of our Standards, which were carried hanging at a Pike, like to the Banners of our Churches. Theſe Sails were for moſt part of a Purple Stuff embroidered, whereon were ſet in Golden Letters, the Names of their Emperours, or of their Commanders.

Aurea clarum nota nomen ducum vexillis præſcriptum feriunt.

The

The ſame is in uſe amongſt our Horſe, whereof moſt part of the Maſters de Camp cauſe their Arms or Deviſes to be put upon the Standards of the Troops of their Regiments.

The Perſians had Eagles for Enſigns, and the Ancient Germans carried the Figures of Wild Beaſts.

CHAP. III.

Of Trumpets, Drums, and other Inſtruments of War.

THE Inſtruments of Military Symphony are not onely proper to give the Souldiers the ſignal of what they are to do; but likewiſe to animate them to Fight after the manner of the Lacedemonians. The Cavalry make uſe of Trumpets and Kettle Drums.

The Trumpet is an Inſtrument of Braſs doubly crooked, which *Hegi-*

nus

nus ſays, was invented by *Thireime* Son of *Hercules.* This definition *Vegetius* gives of it: *Buccina quæ in ſemetipſo æreo circulo reflectitur.* *Ovid* in this manner deſcribes it to us.

—— Cava buccina ſumitur illi,
Tortilis in latium quæ turbine creſct ab imo.

There is no Troop of our Gend'arms, nor Light Horſe, which has not at leaſt one Trumpet, to ſound to Boots and Saddle, to the Standard, to Horſe, the Charge, the Challenge, and the Retreat.

Kettle-Drums are two Brazen Veſſels, round at the bottom, and covered above with Goat-Skin, which is made to ſound by beating on it with Sticks.

Kettle-Drums were more in uſe among the Germans and Spaniards, than among the French, who heretofore never carried any but when they won them from their Enemies. That Ancient formality is now out of date, and the King beſtows them on whom he thinks fit; eſpecially on the Troops of his Houſhold.

Drums, Fifes, Bagpipes and Hautbois,

bois, are for Foot, Musketeers, Dragoons, Fuſiliers, and Horſe-grandaiers. Drums are made of a Cheſnut Wood, hollow and covered at both ends with Skins of Parchment, which are braced with Cords, and with Snares underneath. Theſe Inſtruments ſerve to beat the Reveilly, the General, the Call, the March, the Charge, the Parley, the Retreat, the Banks or Proclamations, and all the Commands. The Invention of them is not late; as may be ſeen in the following Chapter.

CHAP. IV.

Of the Inſtruments of War uſed by the Romans.

THE Inſtruments of the Roman Militia, whereof they made uſe to ſignifie all the Orders to the Souldiers, were Trumpets, Horns, Cornets, and Hautbois, as

as well for Horſe as Foot; and the Legions, *Cohortes* and *Manipules*, had each their ſeveral Inſtruments. *Cohortium, turmarum, & legionum tubicines ſimul omnes canere jubet*; ſays *Saluſt.* Though Drums and Kettle-Drums were not in uſe among the Romans, yet other Nations, and eſpecially the Indians, uſed them. *Indi tympana ſuo more pulſantes. Curtius lib.* 8. and *Suidas*, *Tubis Indi non utuntur, ſed pro iis ſunt flagella & tympana horribilem quendam bombum emittentia.*

The Parthians made uſe of them alſo, but in all appearance (according to the Deſcription that we have of them in *Suidas* and *Plutarch*) the Inſtruments of theſe People were rather Kettle-Drums than Drums, becauſe they were made of Plam-tree Wood, hollow and filled with little Brazen Bells, the mouth whereof was covered with a Bulls-hide. *Iſidorus* defines the word (*tympanum*) in theſe terms: *Tympanum eſt pellis vel corium ligno ex una parte extenſum.* And that

that is the very ſhape and figure of our Kettle-Drums.

He deſcribes alſo another Inſtrument which he calls *Symphony*, which can be nothing elſe but our Drums. *Symphonia*, ſays he, *vulgo appellatur lignum cavum ex utraque parte pelle extenſa, quam virgulis hinc & inde muſici feriunt.* That Inſtrument reſembles the little Tabers or Drums which the Turks carry before them, and which they beat on both ſides with Sticks. However it be, there is no doubt but that the Invention of Drums is as Ancient as that of Trumpets: I build not onely on the Authority of prophane Hiſtory, but on the Teſtimony of the Royal Prophet, who ſays, *Let them praiſe his Name with the Flute; let them ſing praiſes to him with the Timbrel and Harp, Pſal.* 149. *Praiſe him Timbrel and Flute, &c. Pſal.* 150.

A particular Chapter of the Arms which are at present in use, as well among the French as other Nations.

SInce Gun-powder hath been invented, there is no People in Europe but makes use of Fire-Arms, to which they have given several names, according to their different shapes, as Muskets, Arquebusses with Match-Lock, Arquebusses with Wheel-Lock, Carabines, Choques, Pistols with Wheel-Locks, Holster or Pocket Pistols, Musketons, and Fusils or Fire-locks; as the Ancients changed the names of their Shields, Pikes, Swords, and Darts, according to the divers alterations that happened, either in the form or matter: for instance, They called *Aclides* a kind of Ancient Dart, which they carried tied

tied to the Wriſt with a long Strap or Thong, that thereby they might more eaſily draw it back when they wounded any therewith; and they called *Gevum* a Dart that was intirely of Iron: Neverthèleſs theſe Arms were ſtill Darts: as Muskets, Musketons, Carabins, Choques, and Fuſils or Fire-locks, are all of them kinds of Arquebuſſe of different lengths; of which ſome fire with a Match, others with a Flint, and others with the Wheel. Arms with Wheels are now no in uſe in uſe in *France*, the King hath not long ago taken them from the *Gardes du corps*, and given them Musketons; and at preſent in the Wars, are onely uſed the Muſket, Fire-lock, Musketon, and Piſtol; as may be ſeen in the ſequel of this Chapter.

The Arms of the French Cavalry.

The Kings Guards *du Corps*, the *Gens-d'Armes*, Light-Horſe, Cravats,

the Troops of Light-Horſe, are armed with Shables, Musketons, Snaplock Piſtols; and for Inſtruments of War, have Trumpets and Kettle-Drums. The *Guards du Corps* carry Enſigns, the *Gens-d'Armes* Enſigns and Guidons, and the Light-Horſe Standards.

The Kings Musketeers, who fight ſometime on Foot, and ſometime on Horſe-back (like the Dragoons of *Alexander* called *Dimachæ*) have for Arms the Half-Shable, the Bandeliers, the Musket and Piſtols; and for Inſtruments, Drums, and Haut-bois, with an Enſign and Guidon; and when they are on Foot the Officers march with the Sword, the Pike, and the Gorget; the Enſign with the Colours, and the Quarter-maſters with the Halbard.

The Dragoons who fight on Foot and on Horſeback, have for Arms the Sword, the Fire-lock, and the Bayonet; for Enſign the Standard ſomewhat larger than that of the Light Horſe, and for Inſtruments of War,

War, Drums, Bag-pipes, and Haut-bois: And when they march on foot, the Officers carry the Partiſan, and the Sergeants the Halberd. None of the Cavalry but the Officers and the Troopers of the Regiment of the Kings Cuiraſſiers, now carry Cuiraſſes.

The Horſe-Granadiers of the Kings Houſhold, have for Arms the Cimeter, the Battle-Axe, the Fire-lock, and the Pouch or Budget filled with Granadoes; and for Inſtruments Drums and Haut-bois.

The Arms of the French Infantry.

The Arms of the Officers of Foot, are the Sword, the Pike, and the Gorget. The Arms of the Sergeants, the Sword and the Halberd; and of the Souldiers, the Sword, the Bandelier, the Musket, and the Pike. The Inſtruments are Drums, Fifes, and Haut-bois.

The Pikes of the Kings Guards carry the Burgonet, Corſlet, Vambraces, and Taſſets, or Thigh Pieces.

The Granadiers have for Arms the Sword and Fire-lock, with a Budget ſtuffed with Granadoes, and a little Battle-Axe; and the Officers the Partiſan and Gorget.

The Fuſiliers have for Arms the Sword, the Bayonet, and Fuſil or Fire-lock, and the Officers the Pike and Gorget.

The Suiſſers have no need of Horſe, becauſe they live in a hilly Countrey; and therefore they make onely uſe of the Sword with a great Branched Hilt, the Bandeliers, Musket, Hallard, and Partiſan, and carry hardly any Pikes, but when they ſerve Foreign Princes. Their Inſtruments of War are Drums and Fifes; and their Officers carry the Pike and Gorget.

The Pikes in the Suiſſe-guards are armed with Murrions, Gorget, Corſlets, Vambraces and Taſſets; and the Officers with the Pike, Gorget, Cuiraſſe, Taſsets, and no more.

The

The Spaniſh Cavalry,

The Spaniſh Horſe have for Arms the Shable, Piſtol, and Musketon, or Choque; for Enſign the Standard, and for Inſtruments, Trumpets and Kettle-Drums.

They have alſo ſome Troops of Lancers armed Cap-a-pied, which they have retained for oſtentation and to ſerve near the Kings Perſon. They have alſo Troops of Dragoons armed in the ſame manner as ours are.

The Spaniſh Foot,

The Foot have for Arms the Sword, with a Hilt ſo extreamly wide and deep, that it might very well ſerve for a Drinking Cup; Bandeliers which are none of the largeſt, the Musket as heavy again as ours, and of a bigger ſize, which they cannot fire without leaning it on a Reſt; and the Pike longer and bigger than ours:

and for Inſtruments, Drums and Fifes.

The Officers carry no Gorgets, but onely the Pike, and the Sergeants the Halbard.

The Officers of the Regiments of Guards, mount the Kings Guard on Horſe-back, armed cap-a-pied, with a Rondache or Round Buckler on the Left Arm.

Engliſh Forces.

The Engliſh Cavalry have for Arms the Shable, Musketon, or Carabin and Piſtol: And the Infantry the Muſket and Pike. The Foot make but little uſe of their Swords; for when they have diſcharged, they fall on with the Buts of their Muskets. The Officers carry the Sword, Pike, and Gorget, and the Serjeants the Halbard and Partiſan.

German Forces.

The German Horſe have for Arms the

the Shable, Carabine, and Wheel-lock Piſtol, with a Shable hanging at the Pommel of their Saddles; ſome of their Troopers are armed with Cuiraſſes and Head-pieces. The Foot carry the Sword, Musket, Eſpadon, or two-handed Sword, and the Pike. The Officers make uſe of Swords, Pikes, and Gorgets, and ſome of Partiſans or Half-pikes.

Hungarian Forces.

The Hungarians, beſides Fire-Arms, carry likewiſe Shables, Battle Axes, Partiſans, Half-pikes, *&c.*

Polonian Troops.

The Polonians uſe Fire-Arms, Pikes, Partiſans, the Axes (whereof we have ſpoken in the Firſt Chapter of Staff-Arms, the Fifth Sect. of the Firſt Book) and Darts or Javelots.

Turkiſh Cavalry.

The Turkiſh Cavalry have no other Arms but the Damask Shable, and ſome of them carry Clubs or Maces at the Pommel of the Saddle. They have ſome Troops of Lancers, whom they call Fool-hardy; theſe make uſe of Shables, Lances and Bucklers: their Enſigns are ſmall Guidons which they carry tied on their Backs.

Turkiſh Infantry.

The Infantry carry Shables, long Knives at their Girdle, great Muſkets, Bows, Arrows, and Darts, and their Inſtruments are little Tabors or Drums; on both ſides of which they beat: Haut-bois, Bagpipes, and Muſical Cornets.

Perſians, Moors, and Arabians.

The Perſians, Moors, and Arabians, beſides Fire-Arms, make uſe of Zagayes,

Zagayes, Arrows and Darts; and moſt part of the People who have been lately diſcovered, uſed no other Arms, but Arrows, Darts, and Half-Pikes.

Of the Arms of the Ancient French Militia.

Infantry.

THE Regiments of French Infantry were divided into Companies of Arquebuſſiers, Musketons and Pikes.

The Companies of Arquebuſſiers conſiſted of three hundred men apiece, whereof fifty were armed with the Breaſt-plate, Murrion that was proof, with Sleeves of Mail, the Sword hanging at the Girdle and Halbards; fifty were armed with Swords, Muſkets, Bandeliers, and Musket Reſts, and two hundred were armed with

Swords,

Swords, Match-lock Arquebuſſes, and a Caſe, ſuch as Huntſmen carry, the Charge whereof held half an Ounce of Powder. The Captains of the Arquebuſſiers, mounting the Guard, or paſſing before the King or the General at a Muſter, carried the Arquebuſs, the Caſe and Murrion, with a great Plume of Feathers. The Pike-men were armed with Swords; Pikes eighteen foot long, Murrions, Corſlets, Vambraces, and Taſſets; and the Captains were armed with compleat Armor, a Pike and Murrion after the Milaneſe-faſhion, adorned with Feathers, and cauſed their Lackeys carry Rondaches or Round Bucklers before them. The Lieutenants and Enſigns Arms were the ſame with the Arms of the Captains, and the Serjeants carried the Cuiraſſe Proof, with Sleeves of Mail, the Plain Murrion, and the Halbards without Swords.

Caval-

Cavalry.

From the Reign of *Lowis* the Eleventh, to the time of *Henry* the Second, the Cavalry was divided into Men of Arms, Light Horse, Argolets and Estradiots or Albanian Horsemen.

The Men of Arms had for Armature the Corslet with the Breast-plate, the Cuiraſſe with Taſſets, the Gorget of Mail, Supeters, whole Greaves, Taſſes, Gantlets, Helmet with Banners, Arm-pieces, Goſſets, Poldrons, all guarded with Mail in the void ſpaces or Intervals. Their Horſes were barded and capariſoned, with the Crannet and Frontſtall. For Offenſive Arms they had, the Sword by the ſide, the Tuck at one ſide of the Pommel of the Saddle, and the Battle-Axe at the other, a long and great Lance in hand; a Caſſock which they called the *Souldiers Coat*, which was of the Colour of their Enſign, and

and Guidon of the Troop, and bigger than that of the Light Horſe.

The Light-Horſe were armed with Gorgets, Corſlet with Taſſets below the Knee, Gantlets, Arm-pieces, great Shoulder-pieces, Head-pieces, with open Viſers, and the Caſſock of the Colour of the Standard. And for Offenſive Arms, a large broad Sword by the ſide, the Battle-Axe at the Pommel of the Saddle, and the Lance in hand.

The Eſtradiots were armed in the ſame manner as the Light-horſe, and and inſtead of Arm-pieces and Gantlets, had Sleeves and Gloves of Mail, a broad Sword by the ſide, the Battle-Axe at the Pommel of the Saddle, and the Zagaye in hand, which they called Arzegaye, ten or twelve foot long, and headed with Iron at the two ends. Their Coat over their Arms was ſhort, and inſtead of a Cornet, they had a great Banderoll hanging at the end of a Lance.

The Argolets were armed in the ſame way as the Eſtradiots, except the

the Head; which they covercd with a Cabaſſet or Casket, that hindered them not to take aim: Their offenſive Arms were the Sword by the Side, the Battle-Axe at the left ſide of the Pommel of the Saddle, and at the right an Arquebuſs two foot and a half long, in a Caſe of Tanned Leather, over their Arms a ſhort Coat, like to that of the Eſtradiots, and a long Banderoll (as they had) to rally by.

The Cavalry under Henry *the Fourth, and* Lowis *the Thirteenth.*

IN the Reigns of *Henry* the Fourth and *Lowis* the Thirteenth, the Cavalry were divided into *Gens-d'armes*, Light-Horſe and Carabins.

The *Gens-d'armes* were armed with compleat Armour, and carried Greaves and Knee-pieces under or over the Boots, the Cuiraſſe Carabin-proof,

proof before and behind; and instead of a Lance an Escopette or Petronel, which carried five hundred paces; the Holster Pistols charged with a Slugg of Steel, a long and stiff Tuck without an edge. Their Horses were armed with the Frontstall and Petrel.

The Light-Horse were armed with compleat Armour, a Cuiras, that was proof, and the rest but slight; they carried the Pistol at the Pommel of the Saddle, under the Bridle-hand, and on the other side the Salade or Head-piece.

The Carabins had for Arms a Cuiras voided and cut in the Right Shoulder, that they might the better present and take aim; a Gantlet reaching the Elbow for the Bridle-hand, a Casket on Head: and for Defensive Arms, a long Sword, a long Escopett or Carabin, three foot and a half in length, a Pistol at the Pommel of the Saddle, and two Cartouches, after the manner of the *Reistres.*

The

The Word (*Carabin*) comes from the Spaniſh Word *Cara*, which ſignifies the Viſage or Face, and the Latine Word *Binus*, which ſignifies double; as if one ſhould ſay, Men of double Faces, becauſe of their way of fighting. Sometimes flying, and ſometimes facing about.

We have changed the Carabins into Souldiers that fight, both on Foot and Horſe, whom we have called Dragoons, in imitation of the *Dimachæ* of *Alexander* the Great; which Name comes from the Greek Word *Dimas*, that ſignifies terror and fear; becauſe they carried Dragons for their Enſigns.

FINIS.

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And alſo you may there have all ſorts of Paper and Paper Books, and the beſt Ink for Records,